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COAL

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SINCE some misunderstanding has been occasioned by the notice in the ENGINEERING AND MINING JOURNAL of December 6th that Mr. FRANK W. ELKINGTON is no longer connected with this paper, we beg to say that the name is not to be confounded with Mr. SAMUEL A. ELKINGTON, a valued member of the business staff of the ENGINEERING AND MINING JOURNAL, and who is at present in Pennsylvania representing this paper.

ON another page we record very briefly the services to the great coal industry of two of its youngest, most able and successful managers whose too early deaths deprived the country of valuable services and have caused sincere sorrow to their many friends. Mr. HENRY LOVERIDGE was a man of remarkable ability, and to him do the independent operators of the Cumberland coal field owe their present existence as such. It was he also who broke up the corrupt canal boat ring which for so many years levied a dishonest tax on the shippers.

Mr. BERWIND, a still younger man, was the great pioneer in the development of the Clearfield coal trade; a man also of great ability who, however, was not required to fight for the very life of the interests committed his care as was Mr. LOVERIDGE.

We earn the thanks of all who knew these able men in presenting such excellent portraits of them and in placing upon record this heartfelt tribute to their worth.

THE COMSTOCK MILL SWINDLE.

The struggle of the Comstock Mine stockholders against the swindling mill ring goes on bravely and in a manner that will certainly prove successful. Every Comstock stockholder should enlist for the war. They may remember that some ten years or so ago, when JOHN H. BURKE and some others brought suit against the bonanza firm, they brought this to terms and recovered every dollar claimed on the interests represented. At that time all of the stockholders were invited to join, and even after Mr. BURKE had secured judgment against the bonanza firm; but very few did so, and consequently they lost their money. Now a still better opportunity is offered and all should accept it.

The evidence already secured by an examination of Senator JOHN P. JONES, the head of the Comstock mill ring; by that of EVAN WILLIAMS, the superintendent of the mills, who is also a State senator, and the chief owner of the Bullion & Exchange Bank, through which the bullion is transferred from the mines to the United States Mint, and loses its identity while paying a heavy tax to the bank, has thrown much light on the neferious proceedings of the ring, and there is much more evidence to come. Undoubtedly some of the guilty ones will turn State's evidence, if indeed they have not done so already, to save themselves.

The information given in our correspondent's letter will surprise some stockholders. But even this does not give the full extent of the "steal," for the "pulp assays" which are officially given by the mills are themselves dishonest; not that the assays are not correctly made and reported, but that the samples assayed are "doctored" to suit the exigencies of the steal. These facts will be fully established, and if justice be done, some very prominent individuals will find their positions much changed. The "White Slaves of Virginia City," as the miners who are practically owned by the mill ring have been called, will have good reason to rejoice when this band of thieves is broken up and the mines and mills are worked honestly.

THE HEERDEGEN WATER FINDER.

OUR readers will recollect an account published in our issue of March 15th, in which we described a series of tests carried out by ourselves of a water-finding device used by Mr. JOHN HEERDEGEN, and the remarkable results of these tests, which indicated, as we supposed, either that Mr. HEERDEGEN was possessed of an extraordinary personal sensitiveness to the running of water, or else that his instrument or apparatus had some properties unknown to science, which last is the explanation made by Mr. HEERDEGEN, and which he claims to demonstrate satisfactorily. We have just been informed by a resident of Cincinnati that he recently employed Mr. HEERDEGEN to find water on his place near that city with entire success, the underground stream being definitely located throughout a long distance, and its depth correctly predicted. We learn of many other cases of success, and have not yet heard of any failures. The nature of the apparatus is still somewhat of a mystery, but Mr. HEERDEGEN states that it is sensitive not merely to water, but to motion of any kind, and it discovers water only when in motion. Even the motion of a watch has an effect upon it, so that it will not give correct indications if a watch is carried upon the person of the operator. During the tests at Cincinnati this curious effect was demonstrated. We are told that Mr. HEERDEGEN is doing a flourishing business with his apparatus, but that he will not apply for a patent upon it, preferring to keep its principle a secret. The fact which we believe is now well established, that Mr. HEERDEGEN, and others using his instrument, can trace underground streams of water, and tell both their volume and the depth at which the water is found, is certainly of very great, almost incalculable value in many cases, especially in the arid regions of the West and at points where a good supply of water is necessary for carrying on large works.

Aside from the practical utility of this water-finding process, its scientific bearing is extremely interesting, for it opens up a vista of interesting possibilities. It is to be regretted, that the whole subject cannot be submitted to a scientific investigation. It is understood that the instrument is a battery suspended by a wire about 24 inches long from a handle. When the operator passes over a stream of water the pendulum swings in the direction of the stream and its depth from the surface of the ground or velocity of current is indicated by the number of swings per minute. So far as we have been able to investigate the matter the virtue of the water finder seems to lie in the personal sensitiveness of the operator to the presence of water, and the instrument is only an indicator making apparent this sensitiveness. We hope, however, to have a full demonstration of the facts at some future time.

RAPID TRANSIT SCHEMES.

The projected East River tunnel to connect New York City with Long Island has now some prospect of being begun at an early date and pushed rapidly to completion. The New York Board of Aldermen has passed a resolution, which it is expected the Mayor will sign, authorizing its contruction, and the president of the company says work will then be begun

as soon as the Long Island City Council grants the necessary privileges at the Long Island end, of which granting there is no doubt.

The importance of the tunnel both to New York City and to Long Island can scarcely be overestimated. The possibility it offers (though we do not believe it probable) of making a seaport at the eastern end of Long Island, and thus saving time in the transatlantic passage, has often been treated of. More immediately important will be its putting Brooklyn in direct railroad communication with the rest of the country without the intervention of ferry boats.

In regard, however, to the use of the tunnel as a means of rapid transit for passengers, and especially for New York business men to and from their homes on Long Island, we submit that it is only one link of a rapid transit system, which system will not be complete until the other necessary link, a rapid transit railroad from the tunnel entrance at Forty-second street to some convenient point "down town," is also completed, or until other tunnels are built.

The pressing "want" of New York City is not alone the means to get with rapidity out of the city into Long Island or New Jersey, but means to get more rapidly from the Battery to Forty-second street. The existing elevated railroads between these two points are now crowded far beyond the limits of comfort and convenience, and even to the danger limit. If any large number of the population of Long Island City and other suburbs of Brooklyn who now find entrance to New York by other routes, especially by the Brooklyn elevated roads and the Brooklyn bridge, should attempt to use the tunnel and the existing elevated roads in New York, the latter would not be able to accommodate them.

The same criticism may be made in relation to the two projected bridges to New Jersey. If one of these were built, having its terminus anywhere between Fourteenth and Seventieth streets, as has variously been stated, how are people to reach the terminus?

The down town business man coming from New Jersey would find it more convenient to take his train, as at present, to Jersey City or Hoboken, then the ferry boat to New York, facing the dangers of the passage through the blockading teams on West street, and walking thence to his office, than to take the train to the bridge terminus up town, and then scramble into the elevated railroad train, where he would "hang on a strap" and be jostled and crowded till he reached the down town station.

The East River tunnel, we hope, may soon be a reality. One or several Hudson River tunnels and even tunnels under the Narrows and New York harbor to Staten Island will certainly follow, but the rapid transit problem within New York City will not be fully solved until it is provided for by quick trains from end to end of the city. The engineering difficulties are by no means insurmountable, and the financial question could easily be met, since years ago the New York Central Railroad offered to build a four-track road from Forty-second street to City Hall, and the offer might possibly be repeated if there were any prospect of its being accepted by the authorities. Committees report in regard to schemes and routes, and their reports are pigeon-holed and forgotten. The Roman Emperor Augustus is said to have made his chief boast that he found Rome brick and left it marble. Would that we could have a mayor of New York who could boast that he found New York with dirty streets and made them clean, that he found it with the Manhattan Elevated Railroad and gave it rapid transit.

THE FINANCIAL PROBLEM IN CONGRESS.

The financial situation in the business world is at the present time very serious, though why it should be so in this country is not easily explained. Since the middle of 1887 general business throughout the country has been active and prices generally satisfactory, and, except in certain districts where the town lot craze has prevailed, there has been no such large or general investment in "wild cat" securities as would have prepared the way for a financial panic such as we have several times in the past gone through. Yet there is no denying that at the present moment it would take little to precipitate a general financial crash. Every one asks, What has become of the money? and there are no wholly satisfactory answers to the question.

The English financial troubles were easily traced to over-investment in the inflated securities of the South African mines and of the Argentine Republic, which country has had one of our familiar "booms," and has now arrived at the liquidation period. It has, moreover, attained the blessing of a single silver (and paper) circulating medium, though nominally possessing a "double standard," gold and silver. The gold has disappeared and is now at a premium of from 200 to 250 per cent.

The Argentine Republic is not suffering from a deficiency but from a depreciation of "circulating medium," and from the collapse of inflated values which the unlimited expenditures of a dishonest government brought about, while its *cedulas*, or paper promises to pay were accepted as good, and that gold was still a circulating medium. The Argentine situation to-day contains many instructive lessons to our financial quacks in Washington.

Here the stringency on the money market has been due to many causes. Thus the McKinley bill, which not only enormously increased the tariff on a multitude of imports but requires these goods to be taken out of bond and the duties paid at the latest in February, 1891, induced enormous purchases in anticipation of the high prices that the increased tariff necessarily would bring about, and the hoarding of money to pay the duties. The payments for these goods are also causing a heavy drain on our resources. When a single New York house has already locked up as much as $700,000 of cash in the safe deposit vaults in order to be ready for these payments in February, an idea may be formed of the effect of this element in the financial disturbance. The fear that they cannot again get the cash induces those who need it in February, to hoard it now.

This is precisely what will happen, if it has not already taken place to a considerable extent, in gold. The fear that the wild silver legislation proposed in Congress may be enacted causes those who study history and those who are naturally timid to anticipate the depreciation of our currency and the disappearance of gold, and they naturally are beginning already to hold their reserves in gold, which they count may soon be at a premium. The effect of any free coinage law would certainly be the disappearance of gold and the consequent large reduction in the volume of our circulating medium.

After all, it is not by any means an insufficiency of gold or silver that is the cause of the present difficulties. The business of the country is not carried on with gold or silver, or notes representing them, to any considerable extent, but with checks, drafts, exchanges for clearing houses, etc.; in other words, with paper, which circulates while public confidence is unshaken, and which suddenly becomes unnegotiable, or ceases to be a "circulating medium" when any public measure affects credit or disturbs public confidence.

The following tabulated statement from the report of the Comptroller of the Currency gives the receipts of national banks on two selected days, and shows clearly on what kind of "currency" the business of the country is done.

CHARACTER, AMOUNT AND PERCENTAGE OF RECEIPTS OF NATIONAL BANKS ON JULY 1 AND SEPTEMBER 17, 1890.

	July 1, 1890.		September 17, 1890.	
Character of receipts.	3,364 banks.	Per cent. of total receipts.	3,474 banks.	Per cent. of total receipts.
Gold coin	$3,726,605	·89	$3,702,772	1·13
Silver coin	1,352,647	·32	1,399,991	·43
Gold Treasury certificates	6,427,973	1·52	6,159,305	1·88
Silver Treasury certificates	6,442,638	1·53	5,908,714	1·81
Legal tender notes	7,881,786	1·87	7,665,666	2·34
National bank notes	5,244 967	1·25	4,371,778	1·34
United States certificates of deposit for legal tenders	520,000	·12	105,000	·03
Checks, drafts, etc.	189,408,708	44·90	168,803,756	51·58
Clearing house certificates	4.391,177	1·04	2,428,834	·74
Exchanges for clearing house	194,290,303	46·06	126,596,873	38·68
Miscellaneous receipts	2,138,022	·50	135,562	·04
Total	$421,824,726	100·00	$327,278,251	100·00

"Our attention is at once drawn to the fact that the total receipts for September 17th are $94,546,475 less than for July 1, 1890. This is undoubtedly due to the great stringency in the money market prevailing at the latter date. Of this difference $92,678,085 is found in the items which represent substitutes for money."

The agitation of such mischievous measures as some of those now proposed in Washington, necessarily unsettles confidence and destroys the negotiability of our chief "circulating medium" to an extent far greater than the value of the entire world's production of silver, even could that be added to our currency.

If the government would extend for six months the time in which must be paid the duties on goods imported before the McKinley bill went into force, it would release a large amount of money and help to restore confidence. The prompt rejection of wild and untried experiments in financial legislation would aid still more; and a disposition to practice economy in the public administration would help still further. Public or private extravagance is a bad foundation on which to base permanent prosperity.

BOOKS RECEIVED

[In sending books for notice, will publishers, for their own sake and that of book buyers, give the retail price?—These notices do not supersede review in another page of the Journal.]

Mittheilungen aus den Koniglichen technischen Versuchsanstalten zu Berlin. Erganzungsheft II., 1890. *Untersuchungen mit Eisenbahnmaterialien.* Von A. Martens, Professor, Vorsteher der mechanisch-technischen Versuchsanstalt. Mit 5 Tafeln. Berlin: Verlag von Julius Springer, 1890.

The Formation of Travertine and Siliceous Sinter by the Vegetation of Hot Springs. By Walter Harvey Weed. Extract from the ninth annual report of the Director of the U. S. Geological Survey, 1887-'88. Washington, Government Printing Office, 1890.

Wedding's Basic Bessemer Process. Translated from the German by William B. Phillips, Ph. D., Professor of Chemistry and Metallurgy, University of Alabama, Tuscaloosa; late Professor of Mining and Metallurgy, University of North Carolina, Chapel Hill; and Ernst Prochaska, Metallurgical Engineer. With a Supplementary Chapter on Dephosphorization in the Basic Open-Hearth Furnace, by Ernst Prochaska. New York, Scientific Publishing Company, 1891. $3.50.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

Preliminary Plotting.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Through your issues of November 22d and 29th appear criticisms of the preliminary plotting method described by us in your issue of November 1st, page 501. We made no claim for its originality and were well aware of the fact that it had been used on the Ordnance Survey of Great Britain, and was engraved at the Ordnance Map Office in 1838. It came under our notice, and, not having seen anything similar, we thought it might be of value to others who had not met with it. We did claim it as "new" and still continue to claim it new to most American engineers. If we are not mistaken, all those who have made criticisms on the method are English engineers or were educated in that country. I must say, however, it is very strange that a gentleman who has been "teaching" plotting methods for 20 years should have neglected to give the younger members of the profession the benefit of his experience until now.

E. M. KEATLEY.

RALEIGH C. H., W. Va., December 2, 1890.

Gold and Silver Production of the U. S. of Colombia.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I send you the notice about the production in gold and silver in Colombia. I take these data from the book of Don Vicente Restrepo, "The Gold and Silver Mines of Colombia," which are, according to the official statistics as follows: "The total production of Colombia since the Conquest may be calculated at $630,000,000, of which $602,000,000 is gold and auriferous silver, and $28,000,000 silver."

It may be distributed as follows:

XVI. century (1537 to 1600)	$50,000,000	XVIII. century	194,000,000
XVII. century	170,000,000	XIX. century	216,000,000

The production in this century is:

1800 to 1810, 10 years	$27,888,000	1851 to 1860, 9 years	22,217,000
1810 to 1821, 11 years	19,510,000	1860 to 1863, 3 years	6,303,000
1821 to 1836, 15 years	39,350,000	1863 to 1869, 6 years	15,689,000
1836 to 1846, 10 years	27,620,000	1869 to 1881, 12 years	33,676,000
1846 to 1851, 5 years	14,256,000	1881 to 1882, 1 year	4,316,000

The production has increased very nearly double in the last four years, within the active mining in Tolima and other departments.

F. PEREIRA GUMBO.

NEW YORK, Dec. 3, 1890.

The Sutro Tunnel Company Ought to be Dividend-Paying.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: We have received from Messrs. Townsend, Scott & Son, Baltimore, Md., a communication in reference to Comstock Tunnel shares.

In our investigations of the misappropriation of the output of the mines on the Comstock lode, we find that it is the common practice among the managers of those properties to reduce the high grade ores to mere milling propositions. As the royalty of the Sutro or Comstock Tunnel Company is dependent upon the grade of the ore (being doubled at $40), it can be seen that this method is liable to lead to great loss to the Tunnel Company. It is a well-known fact that there are thousands of tons of ore crushed that the Tunnel Company never gets one cent of royalty on. If the directors of the Tunnel Company did their duty, the company would be out of debt and on a dividend-paying basis. It is a magnificent property, and in the proper hands would soon be worth a great deal of money; but under the present lax management but little can be expected. The directors of the Tunnel Company should investigate this matter, and if they want any assistance at this end, or any information that we can furnish them, let them correspond with us.

MINING STOCK ASSOCIATION,
per J. H. TINGMAN, Vice-President.

SAN FRANCISCO, December 2, 1890.

The Mining Engineers' Transactions.

EDITOR OF THE ENGINEERING AND MINING JOURNAL:

SIR: I have read with much pleasure the letter of "A Member of the Institute" published in your issue of November 15th, and most cordially endorse the views therein expressed, as I am of opinion that a change in the present method of conducting the proceedings of the Institute is very much to be desired.

I prepared a paper, which was submitted and accepted by the secretary. As this was the first I had written for the Institute, and the meeting at which it should have been read was the first I had attended, I was in entire ignorance of the fact that my paper was to be "read by title" until I had journeyed clear across the continent, and received a programme of the proceedings on my arrival at New York. I felt very much chagrined, and I think justly, after the trouble and expense I had been to, to find that I had, with other unfortunates, been politely shelved. If the paper was worthy of acceptance and publication by the Institute, it certainly ought to have been discussed (at any rate, that is the course pursued by the South Staffordshire Institute of Mining Engineers, of which I once had the honor of being a member); but there was no remedy that I could avail myself of in this case. Several of my English friends expressed surprise at the method adopted by our Institute.

I wish it to be distinctly understood that I have no personal grievance in this matter. The officials of the Institute, it is hardly necessary for me to say, are deserving of unqualified praise for the manner in which the meetings and excursions were arranged and carried out. It is the system I object to, and I am glad to see the subject discussed, as it is sure to bring about the needed reform. Personally I would very much prefer to have any future papers I might submit rejected rather than have the treatment, accorded my first venture, and doubtless there are others of my opinion. My object in joining the Institute was to keep myself informed on the most improved methods of the profession, and on the new fields which are constantly being opened up in our Western country, which information cannot be reliably gained in any other way, except through the columns of the ENGINEERING AND MINING JOURNAL, and if a submitted paper will not in the opinion of the officials of the Institute command the attention of at least a majority of the members, I say, respectfully decline it, no matter who writes it.

A WESTERN MEMBER OF THE INSTITUTE.

Mineral Waxes.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of November 15th last (page 556) appeared a note from Dr. Marcus Benjamin, which should have received attention from me before, but I have waited until I could examine the account he alludes to of the results obtained by Mr. A. N. Seal in the laboratory of the University of Pennsylvania. It has happened that but a day or two since I was able to obtain a copy of Mr. Seal's article, which I find was communicated to the Chemical Section of the Franklin Institute on October 21st, 1890. I cannot just now, for lack of time, enter systematically into a discussion of Mr. Seal's statements, which I must therefore defer to another issue of the JOURNAL. This course is the more appropriate for me, as in my communication, which has apparently instigated Mr Seal's investigation,* I promised a further general article on mineral waxes, with abstracts of the work of different chemists, which latter I have already to a considerable extent collected from the original sources.

I shall therefore confine myself here to some of the points in Doctor Benjamin's last note. As my statements published by you July 13th, 1889, have appeared to him as *somewhat arbitrary contradictions* of his own, I would first say that I regret this very much, and that nothing was further from my mind than to appear in such a light as this. It must be my task hereafter to endeavor to show that the views set forth by me had been by no means *arbitrarily* assumed, and that there is support for them—as I believe, conclusive support—in the way of both facts and authorities.

I will only at present cite and remark upon what seems to me a very curious sentence in Doctor Benjamin's last note, which, quite as curiously, is echoed in Mr. Seal's article. Doctor B. says: "No analysis, as far as I know, has ever been offered by Mr. Wurtz to sustain his views." I did set forth numerous analyses, by analysts of high mark, which collectively exactly sustained my views. I can only infer that a totally unmerited compliment to me as an analyst is implied (if not intended) by both these gentlemen. I must, therefore, most emphatically disclaim on my own part setting up any analyses of my own as having more weight than those of the eminente hemists referred to, or even as adding weight to their figures.

HENRY WURTZ.

2149 SEVENTH AVENUE, NEW YORK, Dec. 3, 1890.

The So-called McArthur-Forrest Cyanide Process.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of the 1st I notice a letter from W. H. Furlonge appended by a request for information concerning the McArthur-Forrest process, as it is styled by the "inventors" of the same.

As the McArthur-Forest process, I candidly acknowledge I know but little of it, but as the Janin process, as I was foolish enough to call it at one time, I gave the matter a thorough investigation at a period considerably antedating Messrs. McArthur-Forrest's earliest experiments.

The experiments I made, I am sorry to say, led me finally, much against my will, to conclusions widely differing from those published by the company which has taken the process in hand. In short, my experiments---numbering in the thousands and covering the whole field---led me to abandon the process as an economical or practical method of gold or silver extraction.

As it is quite possible by this method to get most encouraging laboratory results, my reasons for abandoning my process may well be asked. I will endeavor to give them briefly:

1. The solubility in the solution of other minerals than those of the precious metals.—This leads to the consumption of large quantities of the expensive reagent.

2. The fact that, owing to the decomposition of the cyanide, no stock solution can be carried is a more important objection than it appears on its face. For while the strength of the solution, say down to one-eighth of one per cent., cuts no figure in the results of laboratory experiments, as in any case there is an excess of cyanide above what would be used in operations on the large scale, owing to the small quantity of ore treated, yet if these experiments are made, using moderate quantities of cyanide, say from five to eight pounds to the ton, the results are low, and it is only when the amount of cyanide approaches 20 pounds to the ton, or one per cent. of the ore, that good results are attainable.

3. The difficulty in precipitation.—I may say, speaking generally, that if there is an excess of cyanide in the solution the precipitation is incomplete, and unless there is an excess the extraction is low. My first attempts in precipitation were made with sulphide of potassium with the idea of regenerating the solution. I found that if the K Cy was completely decomposed by the solution of various metals, that is, if no excess of free K Cy was present, the precipitation by this reagent (K_2S) was quite possible, the silver, gold and the base metals coming down as sulphides. But if free K Cy existed in the solution there was no precipitate. The results were the same when precipitation was attempted by the agency of either copper or zinc in the metallic state.

Now, as I observed the curious fact—until then unknown, I believe—that the solubility of any metal in K Cy varied *inversely* as the strength of the solution, and as the precipitation by any metallic agent is due not to any affinity that metal has for the silver or gold, but to the greater affinity the precipitating metal has for cyanogen, it is certain that where an excess of free K Cy exists the amount of silver or gold precipitated will be in inverse proportion to that excess, as so much less zinc or copper will be precipitated.

To sum up the disadvantages of the cyanide process in a nutshell, I will say that to extract a reasonable percentage of the gold and silver, so great an excess of K Cy is required that the extraction is no longer

* ENGINEERING AND MINING JOURNAL, July 13th 1889 pp. 25, 26

economical or profitable. Moreover, if this excess is used it is impossible to completely precipitate by the means advocated by the McArthur-Forrest people. In fact, as a means of extracting gold, I can more conscientiously recommend aqua regia than potassium cyanide.

BUTTE CITY, Nov. 24, 1890. LOUIS JANIN, JR.

How Comstock Mine Owners Are Swindled.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The reports of the various ore yielding mines on the Comstock for the quarter ending September 30th have at last been received. It is not surprising that the managers of these companies held back their reports for two months, for a more discreditable showing could scarcely be made.

Below is given a tabulated statement, which shows the result of the working for the time mentioned.

MINE.	Ore extracted tons.	Gross yield.	Costs and charges.	Profit.	Loss.	Average yield per ton as per bullion statement.	Per cent. of pulp assay saved.	Average pulp as say for quarter.
Con. Cal.&Virg'ia	22,934	327,712.95	334,151.70	.....	6,438.75	1.425	70.8	$20.12
Savage	7,155	102.251.00	108,666.00	.....	6,415.00	1,429	6 .58	21.79
Hale and Norcross	6,055	53,055.00	91,270.00	.....	38,215.00	876	50.87	17.22
Chollar.....	5,750	79,778.09	86.650.00	.....	6,872.00	1,387	66.94	20.72
Alta.....	4,130	32.108.00	54,827.00	.....	22,719.00	777	34.56	22.55
Overman.....	5.866	89,556.91	82,381.52	7,175.59	.....	1,527	80%	18.99
Justice.....	2,600	60,815.97	55,437.30	5,378.67	.....	2.340	85%	27.65
Crown Point.....	8,250	90,622.05	99,711.66	.....	9,089.61	1,098	70%	15.45
Yellow Jacket....	5,426	80,717.27	87,815.33	.....	7,098.06	1,506	69%	21.79
Con. Imperial....	872	13,014.07	46,413.26	.....	33,399.19	.....	.....	.....
Challenge.....	402	6,024,34	20,337.79	.....	14,313 45	.....	.....	.....
Confidence.	37	.....	.....	.....	.....	.....	.....	....
	69,477	935,655.56	1,067,661.36	12,554.20	144,560.06			

As will be seen by reference to the table, the Consolidated California & Virginia Mining Company produced 22,934 tons of ore, netting them a loss of $6,438.75, while 5,866 tons of ore from the Overman Company, showing an average pulp assay of $1.13 per ton less thanthe Consolidated California & Virginia, netted a profit of $7,175.59, the difference being due to the fact that the Overman Company saved 80% of their pulp assay, while the Consolidated California & Virginia Company saved only 70.8% of theirs.

The Consolidated California & Virginia Company crushed four times as much ore as the Overman, the ore being worth $1.13 per ton more than the lesser quantity from the Overman, and yet the Consolidated California & Virginia shows a loss. It is not surprising under this condition of affairs that one of the managers advertises that he is going to Virginia City to investigate the low mill returns.

In the Alta Company they did still worse, saving but 34.56% of their average pulp assays for the quarter, and show a loss of $22,719 on 4,130 tons of rock, which gave, during the quarter, pulp assays which averaged $22.55 per ton. It is fortunate for the stockholders of this company that the shaft is a hole in the ground, or the managers of this mine would have got away with it.

As shown above, their pulp assay for the quarter as publicly given by them was $22.55 per ton. Of this amount they saved according to their bullion statement the large amount of $7.77 per ton.

The record of the Hale & Norcross Company for the quarter is simply criminal. The output of this mine is free milling ore, and similar ore from other mines has been worked to over 90% of the pulp assay, but in this mine for the past quarter they only saved 50.87% of the pulp assay. Such management in other communities would wind up in the penitentiary, but in the State of Nevada it leads to affluence and political preferment.

When it is known that 85% of the pulp assays can be easily obtained, the scandalous, if not criminal, mismanagement of these properties can be understood.

If the mills running the Overman and Justice ores can save 80% and 85% respectively there is no reason but dishonesty for the mills running the ores from the other mines to return less.

It must be understood that it is claimed that it is the custom on the Comstock to permit the tailings and other residue from the ores crushed to go to the mills in addition to the price paid them for milling the ore. This is like offering a premium for dishonesty on the part of the mill owners, as, with the exception of the Consolidated California & Virginia Company, the ores are delivered by the superintendents of the various companies to the mills under verbal contracts and without their value being made known to the shareholders.

As can be seen, collusion, which is oftener the rule than the exception, between the superintendents and the mill owners enables them to manipulate pulp assays to suit themselves and fleece the shareholders in the most barefaced and thorough manner. Taking the figures given for the quarter ending September 30th, and analyzing them, an idea can be obtained of the amount illegally appropriated belonging to shareholders of Comstock companies.

In the Consolidated California and Virginia the difference between 85% and 70·8% amounts to	$66,251.24
Savage, between 85% and 65·58%	30,265.65
Hale & Norcross, between 85% and 50·87%	35,603.40
Chollar, between 85% and 66·94%	21,505.00
Alta, between 85% and 34·56%	47,082.00
Overman, between 85% and 80%	5,103.42
Crown Point, between 85% and 70%	17,737.50
Yellow Jacket, between 85% and 69%	18,773.96
	$242,322.17

which went into the tailings and to the profit of the mill ring.

In addition to this	$242,322.17
They received $7 per ton for crushing 69,477 tons	486,339.00
Making the enormous sum of	$728,661.17

which went to the mill owners for the quarter.

Comparison with the tabulated statement will show that in almost every instance the mines would have paid a profit if the ore had been honestly milled. This scandalous work, of course, could not be done except with the connivance and consent of the superintendents of the mines. That they share in the loot is evidenced by the lavishness with which they distribute their ill-gotten plunder. To them apparently the greatest joy and highest ambition is to loaf around in the easy chairs of some first-class hotel and guzzle champagne. During the quarter just passed, with one exception, the value of the ore at the mines has not been made known to shareholders. They may guess at that and pay assessments to take out dividend-yielding ores that are appropriated by the mill owners and go to buy croquet grounds for the youngsters and luxurious living for loafing superintendents.

Dishonesty has apparently been so long practised in the management of these properties that it is looked upon as no crime, and any attempt to interfere with what these thieves consider their vested rights is looked upon as unwarranted and resented as vigorously as the honest man would resent the interference with his honest rights.

That such a condition of affairs should exist is worse than shameful, and it is a source of congratulation that the present effort to break up this band of rascals promises to be successful.

MINING STOCK ASSOCIATION,
Per J. H. TINGMAN, Vice-President.

SAN FRANCISCO, Dec. 3, 1890.

Diamonds in Wisconsin.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In the ENGINEERING AND MINING JOURNAL of July 12th, in a letter of "A. de Cloizeaux" acknowledging the receipt of Mr. Kunz's work on "Gems and Precious Stones of North America," he says: "As the work is confined to the gems of North America, it may surprise some of its readers to find that diamonds are included in its area. . . . They occur so far in only two geographically remote and geographically dissimilar regions."

I will mention another local section of the country where in the last three years some small diamonds have been found, some ten or more that run in size from ¼ to 2 carats, and many smaller down to microscopic. They are as a rule quite perfect in form; some of them are colorless, some of a bluish or slightly yellowish cast. The locality where they are found is on Plum Creek, in Pierce Co., Wisconsin. The material in which they are found is the well water-worn gravel of the bed of said creek. They are associated with garnets, rubies, gold and occasionally a grain of platinum, as well as plenty of magnetic sand. G. H. NICHOLS.

2017 ELEVENTH AVENUE, South Minneapolis, Minn., Sept. 12, 1890.

When the above letter was kindly handed me by the editor of the ENGINEERING AND MINING JOURNAL, I immediately put myself in communication with Mr. Nichols, and from him obtained the information which I now give:

In the summer of 1887 Mr. Nichols, in company with Mr. W. W. Newell and Mr. C. A. Hawn, of Rock Elm, prospected for gold on Plum Creek, in Rock Elm Township, Pierce County, Wis. They employed some help, and while sluicing for gold one of their workmen detected a bright stone which proved to be a diamond. This was in gravel which had been taken from the bank of the stream at a depth of some feet below water level. Bad weather prevented the continuance of the work then, but as soon as favorable weather came they resumed their search and Mr. Newell found one, while several were found by other members of the party. No more work was done in 1887, but in panning three miles further up the stream Mr. Newell found another diamond which was very much distorted and off-color.

In the summer of 1888 actual sluicing for gold was begun, and in the gravel that occurred at the washout four diamonds were found in three weeks' time. One was found on the surface of the gravel bed, one came from material taken out of a pit some 30 rods from where the other was found at a depth of five or six feet below water level. The most perfect stone was found by a workman, who secreted it. In 1889 prospecting was again resumed on the west branch of Plum Creek, where Mr. Nichols found another diamond in a shovelful of gravel taken from a sluice; two or three small ones were also found in the tailings.

Gold is found all along the main branches of Plum Creek as well as along the smaller runs of their extreme head waters from two to five miles from their junction. From Mr. Nichols I received a series of specimens both of the gold-bearing sands in which the diamonds sent me for examination are said to have been found, and three of the diamonds, weighing respectively twenty-five thirty-seconds of a carat (160·5 millegrammes), seven-sixteenths of a carat (46 millegrammes) and three-thirty-seconds of a carat (19·25 millegrammes); this only, the largest one would cut into a stone of any value. It is a hexoctahedral crystal with rounded faces—white with a slight grayish green tinge. It could be cut into a perfect brilliant of about three-sixteenths of a carat. One side is an L-shaped depression with rounded faces in which there are minute grains of sand. The second in size is a slightly yellowish elongated hexoctahedron. The surface of the crystal is not as smooth as the larger crystal and the entire surface is covered with small crystalline markings. The third in size is an elliptical hexoctahedral twin. The surface is dull and the color white with a tinge of yellow.

The sand which Mr. Nichols sent me I submitted to a microscopical examination and found that it contained in addition to the quartz grains magnetic iron, titanic iron, almandite garnet in grains and in minute perfect dodecahedral crystals, small transparent brilliant crystals, none more than one-third the size of a pin's head, of what appeared to be spessarite or essonite garnet, a number of grains and rolled crystals of monazite and one small grain, said to be of platinum, which was lost before I could examine it; thus resembling in many particulars the gold-bearing sands of Burke County, North Carolina, and Hall County, Georgia.

Interesting as this is, since it is a new locality for diamonds, it is very doubtful if these sands will be more prolific, or the discovery have any more commercial value than the gold sands of North Carolina and Georgia have proved to be up to the present time. GEORGE F. KUNZ.

The Cost of Warships, says the London *Times*, is as follows per ton: England, £30 5s.; France, £46 9s.; Russia, £87 5s. The price per indicated horse power is: England, £30 4s.; France, £56, and the United States, £67 2s.

LEADING COAL MEN.

Henry Loveridge.

No series of biographical sketches of prominent coal men in the last quarter of this century would be complete without that of the late Henry Loveridge, President of the Maryland Coal Company, whose death in August last caused such widespread sorrow. For several generations to come his name will be linked with the development to its present prosperous condition of the Cumberland region.

Mr. Loveridge was born in New York, of English parentage, on November 22d, 1842. After graduating from the college of the City of New York he engaged with Lord & Taylor, where he developed great financial and statistical ability. His reputation in this respect secured him the position of cashier with Morse & Co., the heaviest Wall street brokerage house in 1863. Thereafter for several years he was variously engaged as an expert accountant.

On January 14th, 1873, he was elected secretary of the Maryland Coal Company, which position he held for one month, when he was elected a director in the company, and was also made its vice-president and general manager. Two years later, on February 2d, 1875, he was elected president of the company, and remained in that office until his death. He found the financial affairs of the company so entangled that he applied heroic remedies, with the result that ample working capital was provided. From that period the concern began to prosper, and Mr. Loveridge was recognized as its savior.

Becoming assured that the very existence of his company depended upon owning a railroad from its mines to the city of Cumberland, he started on the great fight and work of his life, which resulted in victory and successful accomplishment, and in which he was strongly aided and encouraged by the ENGINEERING AND MINING JOURNAL. After much effort he succeeded in getting his company and the American Coal Company to unite in the building of the George's Creek & Cumberland Railroad. These two coal companies took a controlling interest in the stock of the new railroad company. Mr. Loveridge superintended the building of the road. He met with a determined opposition from the railroad already in existence, as also from the Baltimore & Ohio Railroad Company. Obstructive suits at law were numerous, delaying the progress of the work, but they were all decided in his favor by the highest courts. Mr. Loveridge's talents never shone brighter than when engaged in this warfare. He developed a legal talent and knowledge heretofore unsuspected by his most intimate friends. To his energetic measures and perseverance, the defeat of a railroad monopoly which would eventually have controlled the Cumberland region was due. He also acquired the ownership of the Pennsylvania Railroad (in Maryland), which was a six-mile link connecting the Cumberland and Pennsylvania systems. He held the position of President of the George's Creek & Cumberland Railroad Company from the day of its organization until his death.

Mr. Loveridge was a man of keen foresight and remarkable executive ability, endowed with a generous, kindly disposition, yet like all men of strong convictions and logical minds, a courageous and unflinching combatant. His prescience was a marked characteristic, which enabled him to succeed in all his plans and designs for the companies he represented, in the face of powerful corporate opposition. His most implacable business foes admitted his manliness and all admired and respected him no less than did his many friends, who found him unselfish and compassionate, with heart and purse always open.

Mr. Loveridge was modest and unpretentious to a degree. He had a natural gift for sacred music, a correct taste for paintings and was a connoisseur of works of art. Naturally a man of such marked and varied traits attracted to himself a large circle of sincere friends, who, as well as the business community in which he moved, will long mourn one whose place it would be difficult to fill.

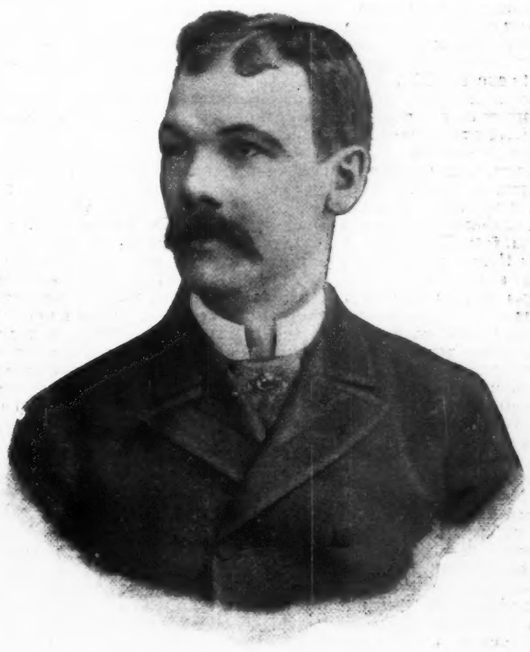
HENRY LOVERIDGE.

Charles P. Berwind.

The unexpected announcement, made in the ENGINEERING AND MINING JOURNAL on December 6th, that Mr. Charles F. Berwind, one of the youngest of the modern coal barons, was dead, caused a shock throughout the coal trade in the Eastern and Southern States. Although he had been far from strong for some years, having contracted malaria, it was not expected that his end was so near, and the brief statement of the fact in the newspapers was immediately followed by expressions of sorrow and mourning from the large circles in which he was beloved and respected.

Mr. Berwind at the time of his death was (as representing the Berwind-White Coal and Iron Company) the controlling influence in enormous mining operations. He was reputed to be one of Philadelphia's wealthiest citizens, was actively engaged in the directorate of many influential corporations, and had yet scarcely entered on the prime of life. His business career of twenty-nine years may therefore be said to be one of the most phenomenal.

Like most men who have risen into the highest prominence and consequent wealth in the coal trade, Mr. Berwind began in it as a boy and remained in it through all vicissitudes. He was born April 1st, 1846, and when he graduated from public high school in 1861 he at once entered the employment of Mr. R. H. Powell, a Philadelphia coal merchant. Within a couple of years he had evidenced such unusual ability and such a grasp of the coal business that he was promoted to the responsible position of assistant to the president of the Powelton Coal and Iron Company and was afterward elected its vice-president.



CHARLES F. BERWIND.

In 1869, while yet only 23 years of age, he organized the firm of Berwind & Bradley, which absorbed the business of the Powelton Company. It was at this time that he devoted himself, heart and soul, to the greater development of the Clearfield region of Pennsylvania. He saw, as he has stated, a great future for the Clearfield bituminous coal, and to his energy more than to any other factor is that development due. It is a matter for congratulation that he lived to see his plans realized. In the Clearfield region Mr. Berwind was respected and revered among the miners, and no mining employer's death could possibly leave a greater blank than his.

In July, 1874, he associated himself with the firm of White & Lingle, which was in turn changed to the firm of Berwind, White & Co., and in 1886 was incorporated into the present company.

Besides his active management of the coal business, Mr. Berwind found time to assist in directing other important business institutions. He was president of the Pennsylvania & Northwestern Railroad Company, one of the directors of the Sunbury & Lewistown Railway Company, a director of the Girard Life Insurance Annuity & Trust Company, the Girard National Bank, the Witmer Land and Coal Company, the Irvonia Lumber Company and other corporations.

It may be credited from this mere statement of fact that Mr. Berwind's successful business career was the result no less of indefatigable energy and application than of a keen judgment, breadth of view and firmness of grasp. To those who knew him socially he was ever the same even-tempered, unassuming and kind-hearted man, wide in his charities, sincere in his friendships, patriotic in his citizenship, and beloved by all classes with whom he was associated, either in business or private life. The greatest sorrow at his demise has been expressed in the city whose interests and reputation for hospitality he had done so much to advance. His

wife and four daughters who survive him have received many demonstrations and expressions of heartfelt sympathy.

Mr. George E. Green, of Binghampton, who was associated with the Berwind-White Coal Company in business, in sending out a notice that his office would be closed on the day of the funeral, reflects the general sentiment when he says: "It is doubtless true, as has already been expressed, that no death could have occurred creating more profound sorrow among those engaged in the coal industry, or causing greater loss to the coal trade.

"In the death of this true friend and strong manly man, we recognize that an irreparable loss has been sustained by the company we have the honor to represent, and we can but regard it as a personal bereavement keenly felt."

COKE-IRON MAKING AT MARQUETTE, MICH.

Written for the Engineering and Mining Journal.

At the request of the Board of Trade of the city of Marquette, Mich., Mr. R. A. Parker, mining engineer, recently prepared and submitted a report on the feasibility of establishing at that locality, a new center of coke-iron manufacture and especially for the working up into finished products of the lower grade Bessemer ores which abound in the Lake Superior district. Contiguity to the mines, and low cost of ores directed investigation into this channel. Could Connellsville coal be bought at Cleveland, transported by water to Marquette and coked there at sufficiently low rates to enable that city to enter into competition with Chicago, Duluth and other western points in the manufacture of coke-iron? Those questions Mr. Parker was commissioned to answer.

Basing his calculations upon a letter from the Pittsburg firm of W. H. Brown Sons, dated September 15th, 1890, Mr. Parker finds that coke can be produced at Marquette, coal costing $3.65 per net ton, f.o.b. cars Cleveland; allowing 33⅓ shrinkage of coal in coking, a ton of coke would cost not to exceed $5.50.

With these figures on coke, and allowing $3.60 per ton for high grade Bessemer ores at the mine, the cost of Bessemer pig per ton would add up to $12.78 exclusive of labor, repairs, etc.

In a compilation of census reports one furnace, reported as a successful concern, is shown to produce the same grade of Bessemer pig as that contemplated above, at $14.55 per ton, and another produces at a cost of $14.12 per ton. Freight rates quoted in connection establish the location of these furnaces at Chicago and Milwaukee respectively.

Coal freights by lake from Cleveland to Marquette are scarcely ever more than one-third of the return rate on ore. It is, therefore, manifestly cheaper to carry coal to Marquette than to transport ores from Marquette to Lake Erie ports. This is an important point in determining the advisability of working up the ores at Marquette. Vessels under contract to carry ore from Marquette, usually go up light for want of coal cargoes, which they would gladly take at the low rates of 40 cents per ton, receiving usually $1.10 per ton of ore on the return trip. The crowded condition of the harbor at Marquette is a perplexing obstacle in the way of providing dockage facilities for handling the immense stores of coal that could conveniently be distributed from that port. The necessity of harbor extension is imperative.

Compared with Duluth, the basis of comparison being John Birkinbine's report to the Duluth Board of Trade in 1887, when ore was $1 per ton higher than now, a balance of 29 cents net per ton of pig iron is shown in favor of Marquette.

Now, as against the foregoing, is placed the result of subsequent inquiries. It is entirely possible to utilize for steel-making purposes leaner grades of ores not expected to stand a heavy rail and lake rate. Present demand for low grade ores is met by non-Bessemers, it being exceedingly difficult to sell Bessemer ores not averaging above 55 % in metallic iron But these Bessemers would be cheaper than the higher grades for steel making, even at a higher rate per unit than present prices demand. Substituting a 52 % ore at $1.50 per ton at the mine for a 60 % ore, costing, say, $3.25, the saving effected will be marked, as shown by the following tables, allowing 2 tons of the lower grade to 1.7 tons of the higher, and adding 1 ton each of limestone and coke to successfully treat the increased silica charge:

1·7 tons ore @ $3 60 per ton	$6.12½
1·7 tons freight @ 45c. per ton	.76½
·4 tons limestone @ 40c. per ton	.16
·4 tons limestone freight @ 60c. per ton	.24
1·1 tons coke (Marquette manufacture) @ $5.25	5.77
Total cost of assembling and materials	$13.06

Compare the following with the above:

2 tons 52 % ore @ $1.50 per ton	$3.00
2 tons freight @ 45c	.90
·5 tons limestone @ 40c	.20
·5 tons limestone freight @ 60c	.30
1·2 tons coke @$5.25	6.30
Total cost assembling and materials	$10.70

which is $2.36 lower than the preceding estimate. These figures take no account of labor, repairs, etc. Many of the mines would be glad to get $1.50 per ton for 52% Bessemer at any time, and especially during next season which threatens to be a dull one. Modern improvements in blast furnaces gradually diminish the element of labor, another feature in the economical aspects of a furnace plant.

In a recent issue of the Connellsville *Courier* the editor of that journal seeks to discredit Mr. Parker's report and even impeaches the accuracy of his figures. It is difficult to see where the editor obtained his information regarding the report except from untrustworthy hearsay. All of Mr. Parker's calculations are based on reliable data. Thus the cost of coking a ton of coal at 40 cents; shrinkage in coking, 33⅓%; bulk gain, 33⅓%; 2,800 pounds of coke per ton of pig iron; cost of ovens fully equipped, $200 each; coke production, 11 tons per oven per week; coal f.o.b. cars at Cleveland, $2 per ton. A careful test of these figures by comparison with information from other sources reveals very slight variations.

NICKEL-STEEL MANUFACTURE.

W, L. Abbott, of Carnegie, Phipps & Co., has personally reported to Secretary Tracy the progress of experiments made for the Navy Department in the manufacture of nickel-steel at the Homestead Works, Pittsburg, Pa. The chemical tests showed the percentage of nickel in the Homestead metal to be 3·16, while in the Creusot plate it was about 3·32. They were thus practically alike. Part of the heat was rolled down into three-quarter-inch plates, from which two test specimens were cut and tested, showing the most remarkable results. The elastic limit reached in the two specimens was, respectively, 59,000 pounds and 60,000 pounds per square inch, and the ultimate tensile strength reached the figures of 100,000 pounds and 102,000 pounds, respectively. The elongation was 15½%, and the reduction of area at fracture was 29½% and 26½%, respectively.

Mr. Abbott stated to a reporter that the experimental heat was made in a Bessemer converter, but there was no doubt but that better results could be obtained by the open-hearth process, by which all steel for naval uses must be made.

It is expected at the Navy Department that a continuation of these experiments will show that nickel-steel is not only the best metal for armor plate guns and projectiles, but that it is especially well suited for hull and engine construction, and for boilers and all work where high grades of steel have heretofore been used.

Inside of the next 90 days Carnegie, Phipps & Co. expect to make their first delivery of experimental armor plates. This will include both nickel-steel and all-steel plates, to be tested in comparison with the results obtained at the tests of the similar plates made in France. The first deliveries of armor plates for ships under their contract with the department will be made about the 1st of June, or sooner. The armor-plate plant at the Homestead Works will be different from that at other establishments, in that the plates will be rolled in a very heavy special mill instead of being forged. The plant will be ready for work as soon as some heavy cranes for handling the plates and a hydraulic press for shaping them to conform to the hull of the ship are erected. The Bethlehem Company will not be able to make deliveries so soon, owing to delays in getting their great 125-ton hammer set up.

HOW FOREIGNERS VIEW THE McKINLEY BILL.

It is interesting to notice the manner in which representative publications of the different foreign nations most injured by the McKinley bill vent the feelings aroused by that act, as any paper widely circulating in the intelligent strata of society must be considered as a typical exponent of the opinions, sympathies or irritations obtaining in those classes. *Chemiker Zeitung* evidently fears to lose its temper if it should make a clean breast of what rankles in its mind. "The McKinley bill is antagonistic," it says, "to the purpose and tendency of universal expositions, therefore we had better keep aloof from the proposed World's Fair at Chicago." The absence of the ponderous German nation from the cosmopolitan gathering, convening at the Lake's Queen in a couple of years from now, would surely constitute a matter of regret to all concerned. But though a Teutonic exhibit could not fail to be both interesting and instructive, the unequaled success of the Paris show last year, to which Germany contributed nothing, proves that the central power of Europe is by no means indispensable on such an occasion, even on its own continent.

The English papers, in their acknowledgement of the splendid hospitality extended to our recent engineer guests, cannot refrain from expressing the reflection that the American people, to be equal to the occasion, should have manifested its sympathies by not passing the McKinley bill. It might be taken for a joke but for the rather sullen tone in which it is uttered. As a rule the English papers take the view that while the high tariff here will lessen their exports to us, they will have full compensation in holding the rest of the world's markets, which they greatly fear we would strongly compete in, were our manufacturers to have the advantages of free raw materials and low cost of production.

L Genie Civil exhibits the wisdom, urbanity and sympathy characteristic of France. It says, substantially, in a recent issue: The interest which France takes in the United States is strong enough to stand the test of a passing frown. . . . Whatever may be objected to the selection of Chicago, instead of New York, as the seat of the next exposition, this will no doubt take place and be successful, too. Chicago men have a will, and where there is a will there is a way. Moreover, we believe that the selection of Chicago as the fair's place is highly advantageous to us since it obliges us to penetrate far into the American continent. In the same ratio as New York is more accessible, our products are better known there. It is the Far West that we had better interest in our manufactures, and if we have the courage to go to Chicago we shall certainly find it worth the trouble. At all events, let us forget the McKinley bill in preparing for the great international *rendez-vous* a year hence in the Lake's Queen.

How Plate Glass is Made.—The casting table in a plate glass factory is about 20 feet long, 15 feet wide and 7 inches thick. Strips of iron on each side of the table afford a bearing for the rollers and determine the thickness of the plate of glass to be cast. The rough plate is commonly nine-sixteenths of an inch thick, but after polishing it is reduced to six or seven-sixteenths. The casting tables are mounted on wheels and run on a track that reaches every furnace and annealing oven in the building. The molten glass having been poured on the table, the heavy iron roller then passes from end to end, spreading the glass to a uniform thickness. In contact with the cold metal of the table the glass cools rapidly. Then the door of the annealing oven is opened and the plate of glass introduced. The floor of the oven is on the same level as the casting table, so that the transfer can be made quickly. When, after several days, the glass is taken out of the oven its surface is very rough and uneven. It is used in this condition for skylights and other purposes where strength is desired rather than transparency. The greater part of the glass, however, is ground, smoothed and polished.

THE PRECIPITATION OF METALLIC SULPHIDES BY NATURAL GAS.

Written for the Engineering and Mining Journal by J. P. Kemp.

The investigations of many distinguished observers tend to indicate that there are two possible and probable varieties of natural gas and petroleum. The two differ genetically, the one having probably been derived from animal organisms, the other from vegetable. It is not the purpose here to follow through the hypotheses of origin; they are too numerous, and will be found cited or abstracted in S. F. Peckham's Report on Petroleum in Vol. X. of the Tenth Census, and fully set forth and discussed in the masterly essay of Edw. Orton in the Geology of Ohio, Vol. VI., pp. 60–83. Suffice it to say that the oil and gas in sandstone receptacles, but mostly originating from bituminous shales, especially as found in Pennsylvania, have been generally attributed to an original vegetable tissue; while on the other hand the oil and gas from limestone have been generally referred to animal tissue. The latter have disagreeable odors (Enniskillen, Canada; Findlay and Lima, Ohio), and are marked by the presence of sulphur compounds. Their importance and general distribution have been of later development. It is not here intimated that the vegetable remains lack sulphur. The general presence of this element in coals, and in illuminating gas derived from coal, proves the contrary, but as shown in the accompanying table, it is a curious fact that in the published analyses of natural gas from Pennsylvania and other sandstones, sulphur does not appear, while in those from Ohio and Indiana limestones it does.

ANALYSES OF NATURAL GAS.

Shale and sandstone gas:	CH_4	C_2H_6	N	H	C_2H_4	O	CO_2	CO	H_2S	Total.
[1]West Bloomfield, N. Y.	82·41		4·31	.....	.....	0·23	10·11	.....	.....	*100.00
[2]Fredonia, N. Y.	90·05		9·54	.....	.....	tr.	0·41	.....	.....	100.00
[3]Burus Well, Butler County, Pa.	75·44	18·12	.....	6·10	.....	.....	0·34	tr.	.....	100.00
[3]Leechburg, Westmoreland County, Pa.	89·65	4·39	.....	0·56	.....	.....	0·35	0·26	.....	95.21
[3]Harvey Well, Butler County, Pa.	80·11	5·71	.....	13·50	.....	.....	0·66	tr.	.....	99.99
[3]Cherry Tree Spring, Indiana County, Pa.	60·27	6·80	7·32	22·50	.....	0·83	2·28	.....	.....	100.00
[4]Sheffield Well	90·64		9·06	.....	.....	tr.	0·30	.....	.....	100.00
[4]Kane Well	90·01		9·79	.....	.....	tr.	0·20	.....	.....	100.00
[4]Wilcox Well	90·38		9·41	.....	.....	tr.	0·21	.....	.....	100.00
[4]Lyons Run Well	97·30		2·02	.....	.....	tr.	0·28	.....	.....	99.60
[5]Neff Well, Knox County, O.	81·40	12·20	4·80	.....	.....	0·80	0·30	0·50	.....	100.00
Limestone Gas:										
[6]Findlay, O.	93·35	.....	3·41	1·64	0·35	0·39	0·25	0·41	0·20	100.00
[6]Fostoria, O.	92·84	.....	3·82	1·89	0·20	0·35	0·20	0·55	0·15	100.00
[6]St. Mary's, O.	93·85	.....	2·98	1·74	0·20	0·35	0·23	0·44	0·21	100.00
[7]Muncie, Ind.	92·67	.....	3·53	2·35	0·25	0·35	0·25	0·45	0·15	100.00
[7]Anderson, Ind.	93·07	.....	3·02	1·86	0·49	0·42	0·26	0·73	0·15	100.00
[7]Kokomo, Ind.	94·16	.....	2·80	1·42	0·30	0·30	0·29	0·55	0·18	100.00
[7]Marion, Ind.	93·58	.....	3·42	1·20	0·15	0·55	0·30	0·60	0·20	100.00

*Including 2·94 "illuminating hydrocarbons," not mentioned in the table.
[1]Henry Wurtz. A. J. S., 2d Series, XLIX., p. 336.
[2]Quoted by Edw. Orton, Econ. Geol., Ohio, VI., p. 409. No authority given.
[3]S. P. Sadtler, Amer. Chem., VII., 97. Also trace C_2H_2.
[4]F. C. Phillips, for 2d Geol. Surv., Pa. Quoted by Orton; l. c., p. 409.
[5]E. W. Morley—Orton, l. c., p. 416.
[6]C. C. Howard. Mineral Resources U. S., 1888, p. 490. From Trenton limestone.
[7]Quoted by Orton, l. c., p. 137.

Thus the sulphureted hydrogen in the limestone gas runs from 0·15 to 0·20 per cent. This may have an important bearing on the origin of ore deposits, as it indicates the form assumed by much of the sulphurous matter in limestones. Experience has shown that natural gas collects especially at the summits of anticlinals which may be very gentle, and along arrested anticlinals or monoclinals.* When in large quantities it favors porous or fissured limestone which may have been brought into this condition by dolomitization. In Ohio almost all the limestones in the State are more or less petroliferous, the Trenton being the principal productive source. The Enniskillen field, in Canada, has been referred by Hunt to the Corniferous, and the oily Niagara limestone of Chicago is familiar to all.

A still wider geological range could be easily substantiated, but the above will serve to illustrate the frequent presence of oil and gas in limestone. With such imprisoned sulphurous material, even though dispersed, a precipitating agent is at hand for any of the common metals that might circulate through the rock in solution. The precipitating agent is especially abundant in the fissured and porous portions, which are likewise most open to circulations. Professor C. C. Howard is the authority for the statement that in 100 cubic feet of Findlay gas there are 125·8 grains of sulphur.† If the calculations are made for the famous Karg well, which produced approximately 12,000,000 cubic feet of gas daily, it will be found that it is equivalent to 2,630 pounds of sulphur. Reducing this to the corresponding amounts of pyrite, blende and galena, it is equivalent to 4,915 pounds, 8,733 pounds and 19,552 pounds respectively. It is understood, of course, that these figures are only illustrative, but they show forcibly the potential precipitating power which may be stored up under favorable conditions. The Karg well is only one among numerous productive wells in a restricted territory. In Indiana,‡ in an estimated area of 2,525 square miles, the daily production of gas is thought to be 700,000,000 cubic feet of a sulphur content, as shown by the table, somewhat less than in the above calculation.

It is reasonable to infer that, in other districts where metalliferous circulations have passed through limestones, similar gases have aided in their precipitation. Where masses of galena, pyrite, blende, or other sulphides are found disseminated through limestones, sulphurous gases and oils may have played an important rôle in their formation. Except as the result of special local study, caution should be observed in citing illustrations; with due reservation, therefore, it is merely suggested that the Saucon Valley blende deposits near Bethlehem, Pa., exhibit the sulphide filling innumerable cracks and small fissures in magnesian limestone along the shattered crest of an anticline.* The blende deposits of southwest Missouri have abundant bitumen (inspissated petroleum?) associated with them,† which is at least suggestive.

Light may be thrown on the chemistry of certain phases of the replacement process which figures so largely in the modern explanations of ores. Lead, for example, circulating as sulphate or chloride in solution would be precipitated as sulphide by sulphurous gas or oil. The resulting sulphuric or hydrochloric acid formed by the reaction would at once be taken by the calcium carbonate present, which would be removed as sulphate or chloride. The same is true of zinc or iron, for, although they are precipitated by H_2S, only in alkaline solutions calcium carbonate is at hand to neutralize at once the free acid resulting from the reaction. In this way a molecular replacement might easily result.

The filling of fissure veins in limestone as well as other rocks is usually attributed to the evaporation of standing solutions, or to the lowering of the temperature and pressure of solutions of metallic sulphides in alkaline carbonates or alkaline sulphides, or both, as they approach the surface. The evolution of sulphurous gases through such fissures would also cause precipitation in rising or standing solutions, and Chamberlain has, indeed, cited for the gash veins of Wisconsin such a method.‡

It would be interesting to note in particular instances whether bodies of disseminated ores may not follow in their distribution the laws now fairly well understood for natural gas and oil, for if they do some hints would be afforded for prospecting.

*See Orton, Geol. Ohio, Vol. VI.
†Geol. Ohio, Vol. VI., p. 137.
‡Mineral Resources, 1888, p. 502.

THE GREAT JEDDO (PA.) DRAINAGE TUNNEL.

The Jeddo Tunnel Company has been organized for the purpose of driving four miles of tunnel with which to drain the Harleigh and Ebervale collieries. John Markle, of the firm of G. B. Markle & Co., is the president. There will be two tunnels, each eight by eight feet. "A" will commence in Butler Valley and extend about three miles to a point near the bottom of Ebervale Mammoth vein in No. 2 slope. It will have three headings, two from the bottom of the proposed slope and one from the Butler Valley side, so that the water will run out as the work proceeds. Tunnel "B" will measure five by six feet, and will be one and seven-tenths miles long. It will commence on a vein beneath the Mammoth from the bottom of Eberville No. 2 slope, and extend to a point opposite Jeddo No. 4 slope. The slope and airway will be sunk on a vein underlying the Mammoth at Ebervale. They will each be 1,000 feet deep, and will measure nine by seven feet and five by five feet respectively. The company is now asking for proposals to do the work. (See advertising pages ENGINEERING and MINING JOURNAL).

In connection with this proposed enterprise a review of the history of these now practically deserted mines will be of interest. In the spring of 1885 the Ebervale mines caught fire, and the Ebervale Coal Company spent over $50,000 in subduing it. Then on June 20 of the same year about 28 acres of ground over the Harleigh mine caved in at a point close to the Ebervale workings. This cave-in caused the creek to flow into the Ebervale mine. About a year afterward the Ebervale Coal Company drilled six holes from whence to pump the water to the surface. The works were then operated successfully until January, 1886, when an unusually heavy rain storm flooded all the mines in that section. The immense amount of water passing through the new canal on the south side of the coal measures filled it to overflowing, and the back water began running into the old channel, and from there into the Harleigh mine. The water rapidly rose to the level of the old gangway connecting with the Ebervale workings, and poured into the latter, submerging the pumps beneath 40 feet of water. Since then no work has been done at Ebervale except the taking out of the rails, column pipes and steam pipes that could be reached above the water, and but little work was done at Harleigh.

Electricity Victorious.—The Paris Gas Company is said to be the first of the important European gas companies that shows a visible decline distinctly due to the increase of electric lighting. The decrease for August and September of the present year, as compared with the same months last year, are respectively eight and six per cent.

Gas Purification.—It is well known that an analysis of a gas purifying mass does not indicate its value. Factors that require to be taken into consideration, besides the composition of the material, are: Weight, size of grain, moisture, the substance for rendering the mass more penetrable, the depth of the layers, the velocity and difference in pressure of the gases previous to entering and after leaving the purifier. In order to find the highest value of a certain purifying mass, Mr. Schilling, the author of an article in the German *Gas Lighting Journal*, passed a current of pure sulphureted hydrogen over the finely-powdered material, retaining the water which was produced by phosphoric anhydride. Even after passing the current through for twenty-four hours, complete saturation did not take place. The chief action was over after three hours. Pure ferric hydroxide absorbs on an average after the first saturation, 30·77 of sulphur, different varieties of bog-iron ore from 11·2 to 28·41; the theoretical amount of sulphur corresponding to the amount of iron oxide present varied from 18·06 to 42·69. From this it will be seen that in no case, not even that of pure ferric hydroxide, was the maximum absorption equal to that theoretically possible. And it does not appear that there is any relation between the amount of iron in the material and the amount of sulphur absorbed. Referring to the difference in absorbing capacity, as influenced by certain physical conditions, Mr. Schilling says that the quantity of sulphur taken up was doubled by interspersing wood shavings in the mass.

*Cleve, F. L. Mineral Resources, 1882. 361.
Drinker, H. S. On the Mines and Works of the Lehigh Zinc Co. Trans. Inst. Min. Eng., L., 67.
Hall, C. E. Rept. D3., 3d Geol. Surv., Penn., p. 239.
†Schmidt and Leonhard. Mo. Geol. Surv., 1874, p. 384.
‡Chamberlain, T. C. Wis. Geol. Surv., Vol. IV., p. 367.

A SUSPENDED FEED-TABLE FOR ROLLING-MILLS.*

By reason of the difficulty and expense of the manual handling of the large masses of metal to be treated in rolling mills, mechanical arrangements for performing the work are necessary. Following will be found drawings of a rolling-mill feed-table designed to subserve this purpose. The details of the drawings are numbered throughout, the same number always indicating the same part.

The side frames of the tables are made of parallel channel bars. Nos. 5, 5, are the feed-rollers, journaled between the channel bars and provided at their ends with beveled gear-wheels, 6, 6, which mesh with beveled pinions, 7, 7, on shafts, 8, 8. The tracks, 9, 9, on which the supporting-carriages are mounted, are upheld by elevated supports in the building, as shown in Figs. 2 and 3, and extend transversely to the line of the feed-tables. They consist of parallel flanged beams, separated so as to permit the passage between them of the suspending mechanism of the feed-tables.

One or more of the cross-shafts, 17, extends across all of the beams, 14, and forms a common axis or torsion-shaft for the laterally adjacent bell-crank levers, 12, so as to connect operatively the whole system of levers and to cause them all to respond to the motion of any one. One of the end levers of the set is connected with the plunger of a hydraulic motor, 18, by a flexible connection, 19, a quadrant lever, 48, and a connecting rod, 49. The motor thus serves to actuate all the levers in such a way that by the movement of the plunger up or down all the tracks may be simultaneously and uniformly elevated or lowered.

The carriages may be moved along the track without disengaging the sprocket wheels, 30, from the chains, and the motion of the chains will, in every position of the carriage, rotate the shaft, 24, and through it the rollers of the feed-table. The operation of the feed-tables is as follows: In order to move the tables laterally from one pass of the rolls to another, or from one set of rolls to another, the carriages, 20, are caused to move on their tracks. If the feed-tables be used in connection with three-high rolls, they may be raised or lowered. The driving of the feed-rollers and the lateral motion of the feed-table are effected by means of the levers, 38 and 47, and the hydraulic cylinder may be actuated or controlled by means of a valve situated in proximity to the levers, so that the whole system may be under the control of a single person.

The means for turning the metal piece over on its side on the feed-tables, as shown in Figs. 1 and 3, comprise a suitable number of rods, 50

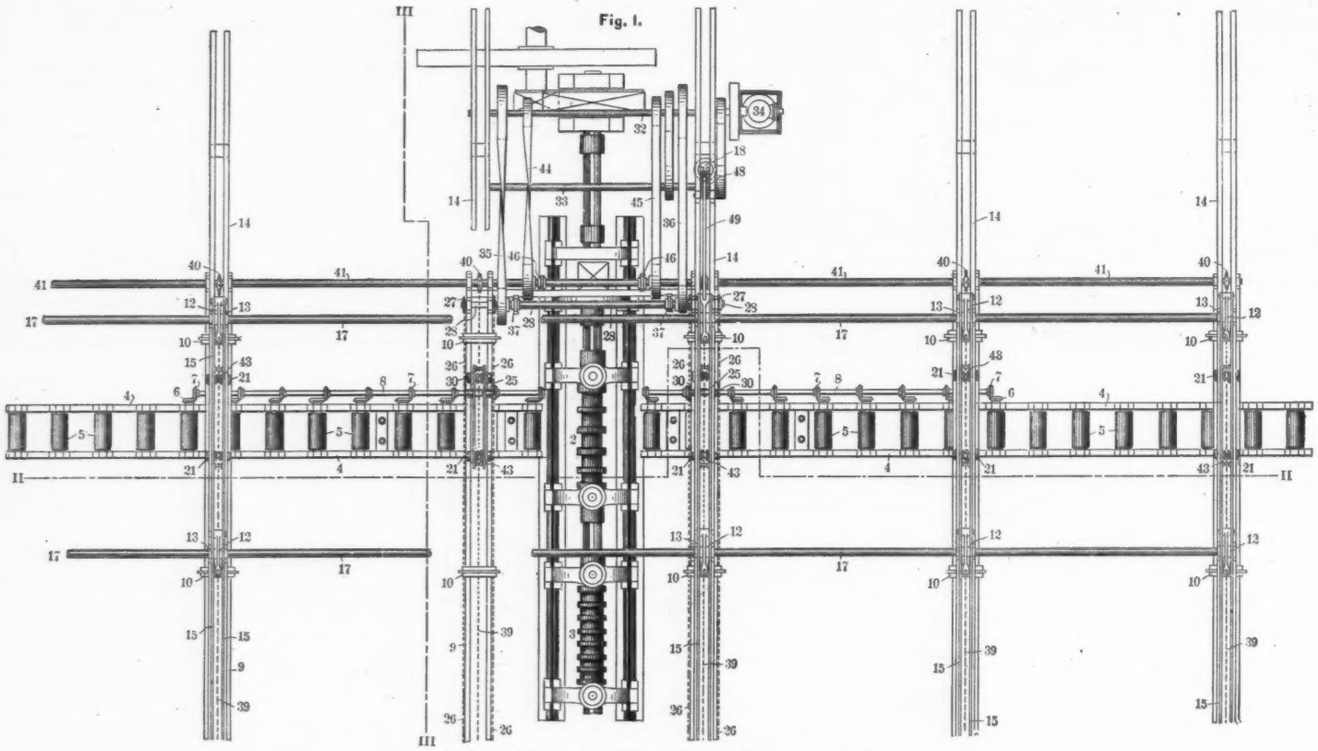


Fig. 1.

SECTIONAL PLAN ON LINE I-I OF FIGS. 2 AND 3.

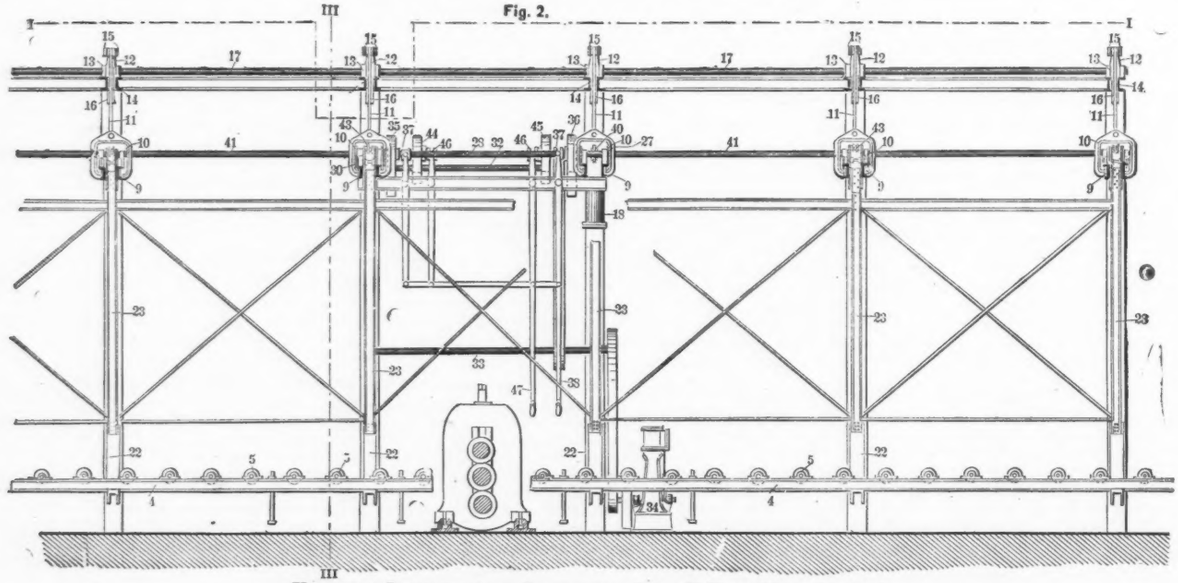


Fig. 2.

VERTICAL LONGITUDINAL SECTION ON LINE II-II OF FIGS. 1 AND 3.

MORGAN'S SUSPENDED FEED-TABLE FOR ROLLING MILLS.

*Abstract of a paper read before the New York meeting of the American Institute of Mining Engineers, September, 1890, by Mr. James Morgan, of Pittsburg, Pa.

and 51, set vertically and loosely in cross-pieces, 52, of the feed-table, so that they shall be movable freely. When the feed-table is at its normal position in front of the passes of the rolls, these rods hang down below the tables, the tops of the rods being below the level of the feed-rollers, as shown by full lines in Figs. 2 and 3. If it be desired to turn the metal piece that is on the table over the rods, 50, the table is lowered until the lower ends of the rods 50 and 51 strike the floor of the mill. This causes a relative upward motion of the rods, as shown by dotted lines in Fig. 3, and the rods, 50, engaging the metal, raise it and tilt it over on its side against the now elevated rods, 51, which serve as stops. By providing the ends of the rods, 50, with steps, so as to enable them to engage at more than one place with the metal, the metal may be turned several times on the table. The feed-table is suspended from above, instead of being supported from below.

THE FINENESS OF JAPANESE COINS.

Messrs. Yoshimasa Koga and Osamu Yamagata, who have kindly sent the ENGINEERING AND MINING JOURNAL their pamphlet On the Fineness of the One Yen Silver Coin, as determined in the Imperial mint at Osaka, Japan, summarize the results in the following manner:

Average of all assays	900·617	900·787	900·331
Highest assay	903·2	903·0	902·7
Lowest assay	898·6	898·1	898·2
Difference between highest and lowest assays	4·6	4·9	4·5

In an ingot made of the alloy containing 900 per mille of silver and 100 of copper, there is, as is well known, a segregation or concentration of silver toward the central line of the ingot. The authors observed that this difference occasionally rose to 4·9 per mille. Even adjacent parts lying in the same line may show a considerable difference in composition, which is probably due to several causes. It was also seen that on an average the coins produced from a melt were about 1·3 per mille higher in fineness than the assay of granulations of that melt, as shown in the following statement:

	A.	B.	C.	D.	Mean difference.
Assay of granulation of melt	899·10	898·75	899·35	898·75	.....
Average fineness of blanks	900·427	899·899	900·678	900·325	.....
Difference	1·327	1·149	1·223	1·575	1·319

Among the methods of cutting portions for assay from the coin, those used in the mint at Washington, Mr. Stas', employed in that at Paris, and the authors' own, deserve mention. According to the first-mentioned, the standard silver dollar is rolled out into a very thin ribbon by means of a pair of small rollers. Numerous small disks are then punched out of all parts of this ribbon, a miniature cutting machine similar in construction to that used in minting operations being provided for the purpose. The disks are then well mixed, and a number of them is weighed into a single assay. This method was found laborious. The small thin disks belonging to one coin are not securely guarded against contamination with very minute scraps of silver detached from another coin operated in the same machine; and, regarding accuracy, the authors found experimentally that the results of many assays made on a single coin according to this method were not sufficiently concordant.

The method in use in the mints at Brussels and at Paris consists in punching out small pieces from certain portions of a coin by the single action of a special machine. These pieces put together make up an assay. The number, positions and forms of the punchings differ in different denominations of coins and have been determined by experiment and calculation. In the case of the five-franc silver coin, similar in size to the silver yen, they are twelve in number, of which seven are circular and punched out near the rim and five square ones arranged in an inner circle.

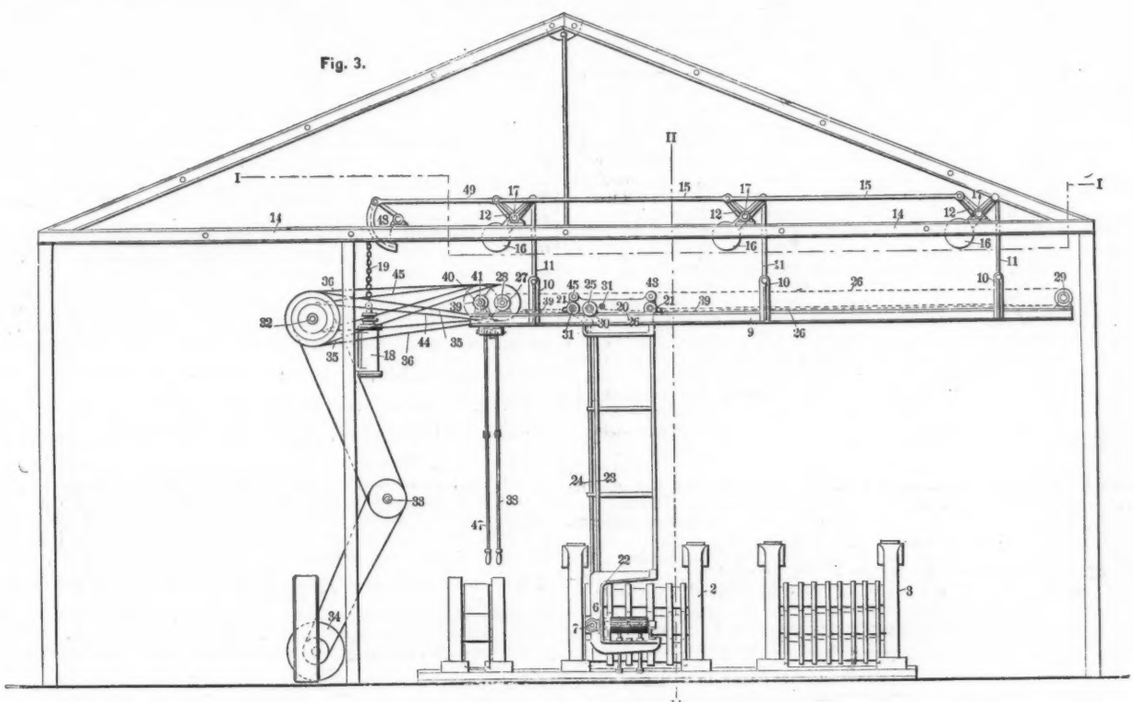
This method as applied to the silver yen coin gave remarkably exact results. But as the cutters were necessarily of so slender a form as to meet frequently with serious accidents the following *modus operandi* was substituted for it: Three circular punchings of equal weight were taken from the angles of an imaginary equilateral triangle on the coin, the distance of the center of each punching from the circumference of the coin being made equal to one-seventh of the diameter. Portions of metal taken from any set of such positions when put together, give almost exactly the average fineness of the entire coin.

The Stas pipette used by the writers in the assaying of silver delivered a nearly constant volume of liquid. The arrangement employed consisted of an overflow tube instead of the ordinary bell-shaped glass suspended over the top of it. It is said to have been first devised by the late Mr. W. E. Dubois, assayer in the Philadelphia Mint, and has been adopted in that mint and also in the Royal Mint in London. Instead of guttapercha the authors made it of glass.

The apparatus consists of a glass bulb blown on one end of a tube. The under side of the bulb is made into a cavity, the top of which is cut open into a hole, thus forming a circular groove inside the bulb. The head of the Stas pipette comes just below the cavity.

The liquid is filled into the pipette from below as usual; any excess of liquid is projected by its own force into the bulb above, and thence round the inner groove, quietly flowing away by the inclined tube to any suitable receiver placed at the end of the tube, without fear of spilling or splashing.

Fig. 3.



VERTICAL CROSS-SECTION ON LINE III-III OF FIGS. 1 AND 2.

MORGAN'S SUSPENDED FEED-TABLE FOR ROLLING MILLS.

Weight of a Cubic Inch of Distilled Water.—H. J. Chaney, the Warden of the British standards, has, according to *Proc. Roy. Soc.*, No. 294, p. 230, obtained the following value for the weight of a cubic inch of water, 252·286 ± 0·002 grains, of which grains the English imperial pound contains 7,000 grains, with $t = 62°$, and the barometer at 30 inches.

Economy of Compound Locomotives.—The Brooklyn Union Elevated Railroad Company lately ran their compound engine for 10 days against a lot of the best simple locomotives on the road. The coal used was all weighed. At the finish of the test the compound was found to have effected a saving of 23½ per cent. compared with the average coal consumed by the other engines.

Effect of Copper upon Rubber.—In a paper read before the British Association, Sir William Thomson stated that metallic copper, when heated to the temperature of boiling water, in contact with the rubber, exerted a destructive effect upon it. With a view to finding whether this was due to the copper *per se*, or to its power of conducting heat more rapidly to the rubber, he laid a sheet of rubber on a plate of glass, and on it placed four clean disks, one of copper, one of platinum, one of zinc and one of silver. After a few days in an incubator at 150° F., the rubber under the copper had become quite hard, that under the platinum had become slightly affected and hardened at different parts, while the rubber under the silver and under the zinc was quite hard and elastic. This would warrant the inference that the metallic copper had exerted a great oxidizing effect on the rubber, the platinum had exerted a slight effect, while the zinc and silver respectively had no injurious influence on it. The rubber thus hardened by the copper contained, strange enough, no appreciable trace of copper; the copper, therefore, presumably sets up the oxidizing action in the rubber without itself permeating it.

THE CALCULATION OF BLAST-FURNACE CHARGES.

By A. Ledebur.*

Translated for the ENGINEERING AND MINING JOURNAL by H. B. C. Nitze, M. E.

The production of definite pig-iron varieties depends upon the melting points of the resulting cinders and the temperature of formation of the same. The first problem therefore to be considered in the production of a certain variety of pig iron must be to make up the charge in such a way that a slag of the proper quality, *i. e.*, of the correct chemical composition, will be produced. This object can be attained, as was formerly universally the case, in an empirical way, by making trial assays—most accurately by melting directly in a crucible—until the wished-for result is obtained. However, our object can be more rapidly attained by calculation, *i. e.*, by the stöichiometric method. If we adopt the latter we must be certain as to the most suitable composition of the cinder for the production of a certain variety of iron under given conditions (using charcoal or coke as fuel, employing a highly or moderately heated blast, etc.)

Reliable analyses of blast-furnace slags, which have been formed under certain definite working conditions, must therefore form the basis of calculation in all of these cases, by means of which we are enabled to make up our charge in such a way as to produce a slag resembling as nearly as possible the chosen normal slag. But as it would be impossible to calculate a charge from certain available ores and fluxes, the composition of whose slag shall exactly coincide with that of a given normal slag, owing to the rather great number of elements occurring in a blast furnace slag and to the variety of materials forming the mixture charged, the furnaceman is satisfied to produce a slag which shall, at least in the main, show an approximate agreement of conditions determining the fusibilty.

We must therefore consider, in the first place, the relation of the silica to the bases; secondly, the relation of the alumina to the stronger bases (lime and magnesia); and, lastly, if possible, the mutual relation of the two last mentioned bases to each other.

It is often observed in practice, that this mutual relation between lime and magnesia is by no means indifferent to the fusibility of the slag.

A slag high in magnesia and low in lime is, as a rule, with the same percentage of silica, more viscous than in the reverse case. However, in calculation of the charge, not only the composition of the slag must be considered, but also the relative amount of the same in comparison with that of the resulting pig iron, and the yield of the charge in iron. The greater the amount of slag, the greater will be the quantity of heat necessary to fuse the same, and hence, the greater the amount of fuel for the production of said heat: the smaller the amount of slag, the more rapid will be the change in its composition owing to the irregularities occurring in the working conditions of the furnace, the more sensitive will the furnace be to every action, and the more readily will it be subject to irregular working. A blast furnace working without cinder is not imaginable anyway. In general, common white iron is more easily produced from charges low in slag production, than grey iron or spiegeleisen. At the same time, it seldom happens that the furnaceman is compelled to increase the amount of slag by adding subsequently the necessary fluxes.

At the iron works in Styria and Carinthia, which produce white charcoal iron from easily reduced ores, the ratio of the resulting slag to the iron does not exceed materially 0·6 to 1; at the Cleveland furnaces, which run on coke foundry iron, it is calculated to be 1·5 to 1; it may reach 2 to 1. A greater quantity of slag than in the last mentioned instance would increase the fuel consumption to such an extent, that only in exceptional cases, would the working of the furnace be considered economical. The yield of the charge in pig-iron bears a close relation to that of the cinder. In most cases it will vary between 25 and 40 per cent. In the Alpine furnaces, mentioned above, it reaches nearly 50 per cent. On the other hand it will only be possible under special conditions to insure successful and profitable working with a lower yield than 25 per cent.

Various suggestions have been offered for simplifying the problem of calculating a charge from given ores and fluxes, so as to produce a cinder of the prescribed composition, whose quantity, at the same time, shall be within the given limits. We will here consider more minutely a method worked out by Mràzek, which seems to be the best adapted for practical use.† From the chemical composition of the ores, fluxes, and coke ashes, ascertained from accurate average analyses, the accompanying table has been arranged.

Columns 1 to 5 contain the slag-forming ingredients expressed in the amounts contained in one part by weight of ores, fluxes and coke ashes.

Should any part of the constituents of the ore, other than iron, be supposed to be reduced—for instance, a part of the manganese or silicon—it must be considered here. In most cases the truth is very nearly approached if we assume that one-half of the manganese goes into the slag and the remaining one-half is reduced. The reduction of silicon can be disregarded in the production of white iron; in the production of gray iron it may be assumed that a certain percentage of silica (SiO_2), equal to one-twenty-fifth of the percentage of iron in the ore (about two per cent. of silicon in the pig), is reduced. However, the reduction of silicon can be disregarded even here, when the amount of slag is tolerably great, as the entire calculation can only afford approximate values, owing to the manifold and incalculable proceedings which take place in the blast furnace (volatilization of various bodies, as chlorides, cyanides, sulphides, unreduced iron passing into the slag, etc.), which must be equalized later on by practical trial.

Column 6 contains the sum of all of the slag-forming constituents, and column 7 the percentage of iron (to which would have to be added any appreciable amount of manganese reduced). Both columns make it possible later on to establish the relation between the slag and the iron in a calculated charge, as well as the yield in iron from the same.

Columns 8 to 13 give the amounts of oxygen contained in the weights of the separate constituents of columns 1 to 5. The sum of the figures in columns 8 to 11 furnishes the figure for column 12, that is the total oxygen in the bases (designated by B), while column 13 (S) expresses the oxygen of the silicic acid (SiO_2). The ratio $S : B$ evidently expresses the degree of silicеousness of the ores, fluxes, etc., in question. From this the figures for columns 14 to 17 can be very simply calculated; they express the amount of oxygen contained in excess, either in the bases or in the silicic acid, whenever a prescribed silicate shall be formed.

In the table used for an example, the calculations have been carried on for a uni-silicate and a bi-silicate; with the same facility it might have been prepared for a sub-silicate, sesqui-silicate or any other degree corresponding to the composition of the slag to be produced. For example, in the Lias ore the oxygen of the bases, according to column 12, is 0·0321, and the oxygen of the acid, according to column 13, is 0·0832 parts by weight in one part by weight of ore. For the formation of a uni-silicate slag in which the oxygen of the bases shall equal that in the acid, the ore contains 0·0832 — 0·0321 = 0·0511 parts by weight of oxygen of the silica in excess. This figure is found in column 15. On the other hand, were a bi-silicate slag to be formed, in which the oxygen of the silica is double that of the bases, $2 \times 0{\cdot}0321 = 0{\cdot}0642$ parts by weight of oxygen of the SiO_2 would be available for the 0·0321 parts of oxygen of the bases. There is, therefore, still an excess of 0·0832 — 0·0642 = 0·0190 parts of oxygen by weight of the SiO_2, column 17.

If we designate, as in the table, the figures in column 12 in general by "B," those in column 13 by "S," in columns 14 and 16 by β, and in columns 15 and 17 by σ, we have, in general:

For the formation of $\frac{1}{4}$ silicate, $\beta = B - 1\frac{1}{2}\,S$ and $\sigma = S - \frac{1}{4}\,B$; for a uni-silicate, $\beta = B - S$ and $\sigma = S - B$; for $\frac{1}{4}$ silicate, $\beta = B - \frac{1}{4}\,S$ and $\sigma = S - \frac{1}{4}\,B$; for bi-silicate, $\beta = B - \frac{1}{2}\,S$ and $\sigma = S - 2\,B$. For the formation of a silicate, in which the ratio of the oxygen of the SiO_2 to that of the bases is n, we have: $\beta = B - \frac{1}{n}\,S$ and $\sigma = S - n\,B$.

The figures for columns 18 to 21 are obtained by simple division, being the reciprocal values $\left(\frac{1}{\sigma}, \frac{1}{\beta}\right)$ of the figures in the columns just under consideration. These indicate how many parts by weight of the ores, fluxes, etc., are available to bring into the charge one part by weight of the oxygen in excess of that in a uni-silicate, bi-silicate, etc.

If one part by weight of ore contains β parts of oxygen in the bases, in excess of that required for the formation of a prescribed silicate, we evidently need, in order to bring into the charge one part by weight of this excess of basic oxygen, $\frac{1}{\beta}$ parts by weight of the ore in question; the same holds good when the ore contains an excess of oxygen from the SiO_2, instead of from the bases. The lias ore No. 1, contains, in one part by weight, 0·0511 parts excess of acid oxygen, for the formation of a uni-silicate, accordingly $\frac{1}{0{\cdot}0511} = 19{\cdot}59$ (column 19) parts by weight of ore are necessary for one part by weight of this excess of acid oxygen.

The figures in the columns headed Stöichiometric Equivalents do, therefore, represent those quantities by weight of the different ores, fluxes, etc., by which, in the formation of a certain silicate, equal amounts of oxygen are brought into the charge.

STÖICHIOMETRIC ORE AND FLUX TABLE FOR —— —— FURNACE.

Name of ore, flux, etc.	One (1) part by weight contains: Slag-forming ingredients. MnO.	CaO.	MgO.	Al_2O_3	SiO_2.	Total	Fe.	Oxygen of the slag-forming ingredients. MnO.	CaO.	MgO.	Al_2O_3	Oxygen of bases. B	Oxygen of acid. S	Amount of oxygen in excess of a: Uni-silicate. In the bases. β	In the acid. σ	Bi-silicate. In the bases. β	In the acid. σ	Stöichiometric equivalents. Amount of ore or flux necessary for the development of one part by weight of *oxygen* in excess of that needed to form a: Uni-silicate. In the bases. $\frac{1}{\beta}$	In the acid. $\frac{1}{\sigma}$	Bisilicate. In the bases. $\frac{1}{\beta}$	In the acid. $\frac{1}{\sigma}$
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Lias ore	0·007	.....	.....	0·065	0·156	0·228	0·428	0·0016	.....	.....	0·0305	0·0321	0·0832	.....	0·0511	.....	0·0190	.....	19·59	.....	52·62
2. Spathic ore	0·023	0·159	0·085	.....	0·011	0·278	0·226	0·0051	0·0454	0·0340	.....	0·0845	0·0059	0·0786	.....	0·0815	.....	12·72	.....	12·27	.....
3. Bog ore	0·003	0·012	.....	0·010	0·095	0·120	0·403	0·0007	0·0034	.....	0·0047	0·0088	0·0506	.....	0·0418	.....	0·0330	.....	23·92	.....	30·30
4. Limestone	.....	0·518	.....	.....	0·021	0·539	.....	.....	0·1480	.....	.....	0·1480	0·0112	0·1368	.....	0·1424	.....	7·31	.....	7·02	.....
5. Ash of coke	.....	0·00	.....	0·150	0·500	0·850	0·100	.....	0·0571	.....	0·0705	0·1276	0·2664	.....	0·1388	.....	0·0112	.....	7·20	.....	89·28

* Handbuch der Eisenhüttenkunde; p. 523 et seq.

† Jahrbuch der Bergakademieen zu Leoben, etc. Vol. 18, p. 282.

All figures appearing above each other in the same column are of equal value in reference to the formation of the silicate; they indicate how much of one ore is necessary to replace another, without a change in the amount of SiO_2 of the resulting slag taking place.

Every basic equivalent will produce a slag of the required degree of siliceousness, with so many acid equivalents as the degree of siliceousness of the slag to be formed indicates; for the formation of uni-silicates (columns 18 and 19) there must be one basic equivalent for every acid equivalent; for a bi-silicate (columns 20 and 21) one basic equivalent for every two acid equivalents, etc.

For instance, the table shows at once that it is possible without the use of any flux to form a uni-silicate as well as a bi-silicate slag from the ores No. 1 and No. 2. In both cases, the lias ore No. 1 furnishes the acid equivalent, and the spathic ore, No. 2, the basic equivalent. For a uni-silicate slag, one equivalent or 19·59 parts by weight of lias ore is to be combined with one equivalent or 12·72 parts by weight of spathic ore.† Thus:

19·59 parts by weight, lias ore, contain O of bases; $19·59 \times 0·0321$ =	0·629
12·72 parts by weight, spathic ore, contain O of bases; $12·72 \times 0·0845$ =	1·075
	1·704
19·59 parts by weight, lias ore, contain O of SiO_2; $19·59 \times 0·0832$ =	1·629
12·72 parts by weight, spathic ore, contain O of SiO_2; $12·72 \times 0·0059$ =	0·075
	1·704

For a bi-silicate slag, two equivalents or $2 \times 52·62 = 105·24$ parts by weight of lias ore are to be combined with one equivalent or 12·27 parts by weight of spathic ore.

105·24 parts by weight, lias ore, contain O of bases; $105·24 \times 0·0321$ =	3·378
12·27 parts by weight, spathic ore, contain O of bases; $12·27 \times 0·0845$ =	1·036
	4·414
105·24 parts by weight, lias ore, contain O of SiO_2; $105·24 \times 0·0832$ =	8·756
12·27 parts by weight, spathic ore, contain O of SiO_2; $12·27 \times 0·0059$ =	0·072
	8·828

As the composition of the separate ores is known, and, as far as the slag-forming ingredients are concerned, is found in columns 1 to 5, the total composition of the slag may easily be calculated after having made out the charge in the manner just explained.

The uni-silicate slag formed from 19·59 parts by weight lias ore and 12·72 parts spathic ore would contain, for instance:

	Parts by weight.	Parts by weight.
MnO from lias ore, $19·59 \times 0·007$	0·137	
MnO from spathic ore, $12·72 \times 0·023$	0·292	
		0·429
CaO from lias ore, $19·59 \times 0·000$.		
CaO from spathic ore, $12·72 \times 0·159$		2·022
MgO from lias ore, $19·59 \times 0·000$.		
MgO from spathic ore, $12·72 \times 0·085$		1·081
Al_2O_3 from lias ore, $19·59 \times 0·065$		1·273
Al_2O_3 from spathic ore, 12·72 by 0·000.		
SiO_2 from lias ore, $19·59 \times 0.156$	3·057	
SiO_2 from spathic ore, $12·72 \times 0·011$	0·139	
		3·196
		8·001

A charge of 32·31 parts by weight of the two varieties of ore will form 8·001 parts by weight of slag, whose percentage composition can now be calculated without difficulty.

If it be desired to determine the total amount of resulting slag, not its composition, we would attain our purpose more rapidly by using the figures contained in column 6. The ratio of the Al_2O_3 to the remaining bases of the slag is $1·273 : 3·532 = 1 : 2·7$. The amount of iron in the calculated charge would be (column 7): $19·59 \times 0·428 = 8·384$ parts by weight; $12·72 \times 0·236 = 2·874$ parts by weight; or, 32·31 parts by weight of charge contain 11·258 parts by weight; *i. e.*, 34·8 per cent. iron. The yield in pig iron would become somewhat higher on account of the percentage of carbon in the same, and would amount to about 36 per cent. The ratio of the amount of resulting slag to the iron is $8·001 : 11·258 = 0·7 : 1$, and accordingly may be considered favorable for the working of the furnace.

If the furnace be run on a fuel high in ash, the percentage of ash must be taken into consideration in the calculation. This may be done as follows: The percentage of ash is ascertained, as well as its chemical composition, and is inserted in the table just as the other constituents were. (Compare table.) Now, the amount of coke necessary for smelting 100 kilograms of ore and flux is estimated, which will usually amount to from 30 to 40 kilograms, average 35 kilograms, and from this the consumption of coke for the calculated charge of ore and flux is obtained by calculation. From the amount of coke required, the resulting amount of ash becomes known, and it then only remains to take from the table the amount of a counteracting ore or flux which is necessary to slag off the same. For instance, the furnace is to be run on coke, the charge for the above calculated uni-silicate consisting of 19·59 parts by weight of lias ore and 12·72 parts of spathic ore. The percentage of ash in this coke is 10 per cent., and its chemical composition is given in the horizontal row 5 of the table. A charge of 32·31 parts by weight will require about 12 kilograms coke, which will produce 1·2 kilograms ash. For a uni-silicate, 7·2 parts by weight of coke ash will make one acid equivalent, consequently 1·2 parts by weight of coke ash will make $\frac{1}{6}$ of an acid equivalent. Therefore, $\frac{1}{6}$ of a basic equivalent will be required to slag off the ash of the coke. If, now, we use for this purpose the spathic ore, $\frac{1}{6} \times 12·72 = 2·12$ parts by weight of spathic ore, besides that required by previous calculations, must be added to the charge, which would then consist of 19·59 parts by weight lias ore and 14·84 parts spathic ore.

If for any reason it be considered more appropriate to bring about the scorification, not by an increase of spathic ore, but by a special addition of limestone, whose composition, etc., is given in horizontal row 4, its equivalent for the formation of a uni-silicate being 7·31 (column 18), then $\frac{1}{6} \times 7·31 = 1·22$ parts by weight of limestone must be added to the charge.

In a similar manner, as has been developed in the preceding example for a charge of only two ores, a charge consisting of as many ores and fluxes as desired may be composed, if the rule is also followed here, that *the sum of all acid equivalents is to the sum of all basic equivalents as is expressed by the figure denoting the degree of the silicate to be formed.*

For the formation of a uni-silicate, every basic equivalent must be covered by one acid equivalent; for a bi-silicate by two; for a $\frac{3}{4}$-silicate by $\frac{3}{4}$, etc.

Should several basic or acid materials occur successively, then the most appropriate mutual relationship of the same to each other must be measured according to their individual peculiarities. In this respect the Al_2O_3 must be taken into consideration in reference to the fact, that the same must be neither too great nor too small, so that the slag shall not be too viscous, and that accordingly it is desirable to make the ratio of the Al_2O_3 to the other bases coincide as nearly as possible with the chosen normal slag; the same applies to the ratio of the magnesia to the lime.

The amount of iron in the calculated charge must now be considered as well as the relation of the resulting slag to the pig iron; furthermore, the amounts of foreign ingredients—phosphorus, manganese and sulphur (under certain conditions)—which enter into the pig iron from one or both ores and influence the quality of the same.

Lastly, we must not forget to consider the relative costs of the ores and fluxes used, upon which the cost of the resulting pig iron will naturally depend.

Let it be required, for instance, to calculate a charge for a bisilicate slag from lias ore No. 1, bog ore No. 3, and limestone, in which the relation of the Al_2O_3 to CaO + MgO shall be from one-fourth to one-third. A proper amount of spathic ore may also be used, according as it suits the purpose. For the formation of a bisilicate there must be one basic equivalent for every two acid equivalents. In the case under discussion, as shown by columns 20 and 21, the lias and bog ores act as acid, and the limestone and spathic ore as basic equivalents. Without the addition of one of the latter materials it would be impossible to smelt the lias and bog ores to produce a bisilicate slag. If we compose a charge experimentally without using spathic ore, consisting of one equivalent each of lias and bog ores, it will have the following composition: One equivalent lias ore, 52·62 parts by weight; one equivalent bog ore, 30·30 parts; one equivalent limestone, 7·02 parts: making total 89·94 parts by weight.

The amount of Al_2O_3 on the one hand and of CaO + MgO on the other will be: 52·62 parts by weight lias ore contain Al_2O_3, 3·42 parts; CaO MgO, no parts; 30·30 parts by weight bog ore contain Al_2O_3 0·30 parts; CaO MgO, 0·36 parts; 7·02 parts by weight limestone contain Al_2O_3, no parts; CaO MgO, 3·63 parts; totals, Al_2O_3, 3·72 parts; CaO MgO, 3·99 parts.

The ratio of the Al_2O_3 to CaO + MgO is therefore much too high. The quantity of lias ore must be decreased and that of bog ore increased. If we reduce the lias ore to 0·2 equivalent, the charge will consist of:

0·2	equivalent	lias	ore	=	10·52	parts	with	Al_2O_3	0·68	parts,	CaO MgO	— parts
1·8	"	bog	"	=	54·54	"	"	"	0·54	"	"	0·65 "
1·0	"	limestone	"	=	7·02	"	"	"	—	"	"	3·63 "
					72·08	"	"	"	1·22	"	"	4·28 "

and accordingly the ratio 1 : 3·5 is satisfied. The amount of iron in the above charge would be:

10·52	parts	lias	ore	contain	Fe	4·50	parts
54·54	"	bog	"	"	"	21·97	"
7·02	"	limestone	"	"	"	—	"
72·08	"	charge	"	"	"	26·47	"

or about 36·7 per cent. Taking the carbon into consideration, a yield of about 38 per cent. of pig iron may be expected, and in this respect the charge would appear thoroughly suitable for smelting, without enriching the percentage of iron—for instance, by replacing the limestone by spathic ore. Cause for this might arise, however, if the lias and bog ores be high in phosphorus, and it be necessary, or at least desirable, to reduce the same.

If we assume that the phosphorus is completely absorbed by the iron, which is at least approximately the case, the percentage of phosphorus in the resulting pig iron will be:

10·52	parts	by	weight	lias	ore	give	0·052	parts	phosphorus.
54·54	"	"	"	bog	"	"	0·654	"	"
							0·706		

These 0·706 parts by weight of phosphorus are absorbed by 26·47 parts of iron, contained in the ores according to calculations above given. Consequently the percentage of phosphorus in the resulting pig iron will be 2·6. Let us assume the spathic ore to be free from phosphorus. If we replace the total limestone by an equivalent amount of spathic ore, the yield of the charge in iron will be increased, and the percentage of phosphorus in the same will be decreased. The charge will then consist of:

							Al_2O_3	CaO MgO	Fe	P
0·2	equivalent	lias	ore	=	10·52	parts with	0·68	—	4·50	0.052
1·8	"	bog	"	=	54·54	" "	0·54	0·65	21·97	0·354
1·0	"	spathic	"	=	12·27	" "	—	2·99	2·77	—
					77·33		1·22	3·64	29·24	0·706

Ratio of Al_2O_3 : CaO + MgO = 1 : 3. Percentage of Fe in charge, 37·8. Percentage of P in iron, about 2·4. The decrease in the percentage of phosphorus would consequently be very small in this case.

The question of the relative costs of the two above calculated charges yet remains to be considered. Such a comparison is only possible when the cost does not depend upon the equivalent weights of the charge, but upon the equivalent weights of the iron contained in the same. For example, suppose the costs of the various ores, including transportation to the furnace, to be the following: 1,000 kilograms lias ore, 9 marks; 1,000 kilograms bog ore, 6 marks; 1,000 kilograms spathic ore, 8 marks; 1,000 kilograms limestone, 4 marks; then, according to our first calculation, using limestone and not spathic ore, the cost of the charge will be

10·52 kg. lias ore, with	4·50 kg. Fe		0·095 marks.
54·54 kg. bog ore, with	21·97 kg. Fe		0·327 "
7·02 kg. limestone, with			0·028 "
	26·47 kg Fe		0·450 "

26·47 kilograms Fe in the charge will cost 0·450 marks, therefore 1,000

† If the spathic ore, as is generally the case, is not charged in the raw state, but is first roasted, the chemical composition of the roasted ore must naturally be taken into consideration in the calculation.

kilograms iron will cost 17 marks. According to the second charge, where spathic ore was used, the costs would be :

10·52 kg. lias ore, with.....	4·50 kg. Fe	.....	0·095 marks.
54 54 kg. bog ore, with.....	21·97 kg. Fe	.....	0·327 "
12·27 kg. spathic ore with.....	2·77 kg. Fe	.....	0 098 "
	29·24 kg. Fe		0·520 "

therefore, 1,000 kilograms iron in the charge will cost 17 marks 78 pfennig, *i. e.*, 78 pfennig more than in the first case, and the cost of the resulting pig iron would be increased approximately by the same amount. If coke be used for fuel it would be appropriate to consider the percentage of ash in the same, as in the former example. If we take, as before the consumption of coke at 35 kilograms per 100 kilograms of charge, and the percentage of ash = 10, with the composition given in the table, then, using limestone in the charge, we would have 24 parts by weight coke and 2·4 parts ash to 72·08 parts charge. For the formation of a bisilicate the equivalent of coke ash = 89·28, therefore the above 2·4 parts by weight will correspond to $\frac{1}{37}$ of an equivalent, and, in order to flux the same, $\frac{1}{4}$ of a basic equivalent, or about 0·10 part by weight of limestone will be necessary, which must be added to the 7·02 parts of limestone already in the charge. If it now be desired to calculate the total composition of the resulting slag, we have :

	MnO.	CaO.	Al_2O_3	SiO_2	Total.
10·52 parts lias ore give.....	0 07	....	0·68	1·64	2·39
54·54 parts bog ore give.....	0·16	0 64	0·54	5·18	6·52
7·12 parts limestone give...	....	3·69	0·15	3·84	
2·40 parts ash give..... ..	...	0·48	0·36	1·20	2·04
	0·23	4·81	1·58	8·17	14·79
Or in 100 parts.....	1 56	32·29	10·73	55·42	100·00

Having once arranged a table of this description, calculated for the various materials to be used in the smelting process, a charge for any given slag may readily be calculated, as shown in the examples just discussed; or else, whenever the constitution of the ores to be used will not permit the formation of a given slag, it will at once become evident from the table.

The table may be used with equal facility for calculating any changes for a charge already in use; for instance, when the stock of one particular ore becomes exhausted, and it is desired to fill its place by another, or when it is desired to reduce the percentage of phosphorus or to increase the percentage of manganese, etc. In practice such cases will occur more frequently than the calculation of an entire new charge, and the solution of the problem becomes the easier in this case, inasmuch as we usually have a slag of steady and known composition, and it is only necessary to change the composition of the charge and not of the slag. *In all such cases the degree of siliceousness remains the same if the mutual relation between the weights of the various ores and fluxes is preserved in the proportion expressed by that of the stöichiometric equivalents of the same to each other.*

In the formation of a unisilicate 19·59 parts by weight of lias ore (column 19) are equal in value to 23·92 parts by weight of bog ore; if, therefore, a certain charge contain 25 parts of lias ore, and it be desired to replace the same by bog ore, $\frac{23{\cdot}92}{19{\cdot}59} \times 25 = 30{\cdot}5$ parts by weight of the same will be necessary. In this case the degree of siliceousness would remain unchanged; however, the percentage of Al_2O_3 in the charge would be decreased by the use of bog in the place of lias ore. Should it be desirable to prevent this, an addition of some material rich in Al_2O_3, as clay slate, would be necessary, and as soon as the composition and equivalency were determined we would be able to recognize from the table the exact manner in which such an addition must be made.

METALLURGY OF STEEL.

In the October number of *Kritischer Vierteljahresbericht uber die Berg- und Huttenmännische und verwandte Literatur*, A. Ledebur, the leading German iron metallurgist, reviews Mr. Howe's book as follows :

"A series of essays called "The Metallurgy of Steel" was started in the 43d Vol. of the ENGINEERING AND MINING JOURNAL and continued for several years. These papers very soon arrested the attention of all experts, as the author proved not only to have a wide acquaintance with American, English, German and French technical literature, but also to be familiar with practice, a qualification without which a writer on technical subjects hardly is able to be of real value.

A periodical is, however, poorly fitted for the publication of so elaborate a work. The fragmentary appearance is a great drawback to its use in study or for reference. Now when the scattered parts have been united in book form, Mr. Howe's work appears in a manner be fitting its dignity as well as usefulness. This stately quarto is the most exhaustive, yet written on the subject. Unquestionably the most valuable portion of the book are the chapters describing the behavior of iron towards substances that play a part in its production, and dealing with the influence on the qualities of iron due to the chemical composition and to the treatment. [An enumeration of the various headings follows here.]

So far as the present state of our science permits, "The Metallurgy of Steel" contains answers to all questions bearing on the subject, and, what constitutes a salient claim to admiration, the information, though exhaustive, is rarely, if ever, marred by prolixity in form ; the author has indeed the right tact for choosing and discarding what is of value and what is not, in the ample literature of iron and steel.

The last part of the volume is devoted to the various methods for producing forge iron. The old and the modern direct processes, charcoal-hearth processes and the crucible steel process, as well as the apparatus for the acid and basic Bessemer process, are described in the order named, to be followed in the next volume by an account of bessemerizing itself, the Siemens-Martin process and the production of puddle and cement steel.

The strictly practical part of Howe's work deserves the greatest recognition. The experienced mill man may here more frequently than in the preceding chapters come across what he already knew, and occasionally, perhaps, also fail to find some certain apparatus or detail described, but the reason for this is in the very nature of the subject. and cannot be laid to the door of the author.

Numerous illustrations signally enhance the value of the book. The typographical work is simply excellent. It is published by the Scientific Publishing Company of New York."

The American Society of Mechanical Engineers celebrated the opening of its new headquarters, No. 12 West Thirty-first street, New York, by a "house warming" on Friday evening, 28th ult. The house, a fine four-story brown stone front building, has been occupied by the society for some months past, but the formal opening was delayed until the alterations, furnishing and decorations were completed. The building was formerly occupied by the New York Academy of Medicine, which sold it to the Mechanical Engineers for the sum of $60,000. It includes a lecture hall capable of seating 175 persons, a library with capacity for over 20,000 volumes, parlors, etc., besides one floor, the third, rented to the Electrical Engineers' Society, and a fourth floor divided into rooms which are rented as bachelor apartments to members. The "house warming" was a brilliant affair. It was opened with an address of welcome by the newly elected president, Mr. Robert W. Hunt, of Chicago, followed by the unveiling of a handsome oil portrait of the late Alexander L. Holley, which was presented to the society by his widow, Mr. James C. Bayles making the address of presentation in her behalf. A reception and a collation followed. The rooms were crowded with members and their ladies and invited guests, among whom were many of the leading members of other engineering societies. The society is to be congratulated on the acquirement of its elegant local habitation, and upon its rapid growth in membership and influence. It now numbers over 1,200 members. Its library fund, made up by small contributions from the members, now amounts to over $2,000, which it is the intention to expend shortly in the purchase of books.

The Recession of the Falls of Niagara.—At a meeting of the commissioners of the State Reservation of Niagara in this city on the 8th inst. State Engineer Mr. John Bogart presented a report upon a survey just made by him, showing the position of the crest lines and bluffs of the falls and facts as to the recession of the falls since 1842, the date of earliest trustworthy record. In that year a survey was made by the State Geologist. The engineer's new survey showed the crest lines of the rocks as they would appear if no water had been falling over them. The total mean recession of the Horseshoe Fall since 1842 was found to be 104 feet 6 inches, or an average of over two feet each year. During the last four years the average had been greater on account of a heavy fall of rock a few years ago. The maximum recession of the Horseshoe Fall at any one point was 270 feet since 1842. The mean recession of the American Fall since 1842 was found to be 30 feet 6 inches. In the same period the length of the crest of the American Fall had increased from 2,260 feet to 3,010 feet. The total area of recession of the American Fall since 1842 is found to be 32,900 square feet; of the Horseshoe Fall 275,400 square feet. State Engineer Bogart also made a report, in response to a request of the commissioners, as to the effect which the diversion of water from the Niagara River through the tunnel lately projected would have upon the volume passing over the American Fall. The point of diversion is 1·36 miles above the falls. It is estimated that about 270,000 cubic feet of water pass over the fall per second. The capacity of the tunnel is 10,000 feet, so that in every three feet of fall there will be a reduction of 1.3 inches, if the tunnel runs full, or less than half an inch upon every foot. From this, it will be seen that the effect of the diversion would not be "particularly appreciable" upon the American Fall.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office:

TUESDAY, DECEMBER 9th, 1890.

442,098. Device for Automatically Regulating Boiler Feed-water. Charles B. Bosworth, Everett, Assignor to the Crosby Steam Gauge and Valve Company, Boston, Mass.
442,102. Steam Engine Indicator. Almon B. Calkins, Bridgeport, Conn.
442,103. Pump. Carlton W. Canfield, Winthrop, Minn.
442 125. Tube Cutter. Frank Levasseur, Gouverneur, N. Y., Assignor to the Gouverneur Machine Company, of New York.
442,156. Tubular Boiler. Henry Warden, Philadelphia, Pa.
442,160. Car Coupling. George H. Williams, Albany, Ore., Assignor of one-half to Rice D. Montague, same place.
442,182. Car Coupling. Joseph S. Haller, Defiance, O.
442,185. Lamp Carrier for Miners' Caps. Charles H. Hobson, Mount Carmel, Pa.
442.197. Steam Generator. Hugh McPhail, Dublin, Ireland, and Edward Simpson, Walton, and Charles H. Simpson, Ackworth, England.
442,262 Apparatus for Treating Ores to Obtain Precious Metals Therefrom. Sidney Trivick, London, England.
442,305. Apparatus for Casting Tubular Ingots. James B. D. Boulton, Jersey City, N. J., Assignor to the Solid Ingot Company, of New Jersey.
442,311. Mining Pump. David Evans, Connellsville, Pa., Assignor to the Boyts Potter & Company, same place.
442,313. Steam Engine. David Evans, Connellsville, Pa., Assignor to the Boyts, Porter & Company, same place.
442,320. Boiler Tube Scraper and Cleaner. Horace S. Ingalls, Melrose, Assignor of One half to J. F & C. G. Warren & Co., Worcester, Mass.
442,335. Process of Treating Asbestos. Isaiah L. Roberts, Brooklyn, Assignor of One-half to Thomas H. McGraw, Poughkeepsie, N. Y.
442,356 442,358, 442,359. Roller Bearing. Ernest W. Cooke, Chicago, Ill., Assignor to the American Roller Bearing Company, same place.
442,357. Journal Box. Ernest W. Cooke, Chicago, Ill., Assignor to the American Roller Bearing Company, same place.
442,368. Steam Balanced Valve for Steam Engines. Francis I. Freeman, Warren, O.
442,401. Piston Engine. Levi M. Shaw, Gypsum, Kan., Assignor to Henry C. Staver, Chicago, Ill.
442,424. Hydraulic Motor. William H. Davis, Daisy, Md., Assignor of one-half to Harry S. Davis, same place.
442,428. Process of Making Metal Tubes, etc., by Electro-Deposition. Francis E. Elmore, Cockermouth, County of Cumberland, England.
442,435. Suspension Bridge. Joshua Harper, Melvern, Kan.
442,442. Coal Hoist. James Jopling, What Cheer, Ia.
442,454. Tube Welding Apparatus. Peter Patterson, McKeesport, Pa., Assignor to the National Tube Works Company, same place.
442,461 Centrifugal Separator. Philip M. Sharples, West Chester, Pa., and David T. Sharples, Elgin, Ill.
442,568. Pump Governor. George A. Boyden, Baltimore, Md., Assignor to the Boyden Brake Company, of Baltimore City, same place.
442,572. Steam Engine. John H. Carriger, Knoxville, Tenn.

PERSONAL.

Mr. Adolf Metzger, mining engineer, has gone to South Carolina, Virginia and West Virginia on professional business.

Mr. Theodore D. Wilson has been nominated by President Harrison to be chief constructor of the navy with rank of commodore.

Mr. T. C. Cloud, superintendent of the Wallaroo Smelting Works, South Australia, is visiting the mining regions in the vicinity of Butte, Montana.

Mr. F. J. H. Merrill, of New York City, has been appointed assistant state geologist of New York, and will continue work on the economic resources of the State, and upon the geological map.

General John B. Newton, of this city, has accepted the position of consulting engineer for the board of trustees of the Chicago Sanitary District, in charge of the location and construction of the great drainage canal.

Mr. Geo. W. Maynard, mining engineer and metallurgist of this city, has gone to Chihuahua, Mexico, where he will be engaged in some extended mining investigations. His address can be ascertained at his office, 31 Nassau street, New York City.

Mr. F. G. Patterson, President of the Altoona & Wopsononock Railroad Company, was in this city during the past week in relation to his line, which is rapidly nearing completion. This railroad will join the main Pennsylvania line at Altoona, and is expected to tap some 5,000 acres of undeveloped coal lands near Altoona. The road is about ten miles in length.

OBITUARY.

Adin Thayer, ex-Canal Commissioner of the State of New York, at one time purchasing agent of the New York Central Railroad and for twenty-five years financial manager of the Walter A. Wood Mower and Reaper Company, died on the 8th inst. at Akron, Ohio, aged seventy-four years.

Dr. N. S. Culver died at Colorado Springs, Colo., on the 3d inst. He was born near Janesville, Wis., in 1842. In 1873 he settled in Colorado. At various times he was one of the principal owners of the Osceola mine, Boulder County, president of the Culver Mining Company, operating in Ouray County, vice-president of the Silver Wing Mining and Reduction Company, of La Plata County, and the originator and a director of the Little Willie Mining Company, of Dunnison County, all of Colorado.

Alfred L. Dennis died in New Jersey on the 7th inst., aged 73 years. He was president of the United Railroads of New Jersey, and was as director or trustee connected, among other institutions, with the National Bank of Commerce, the Mercantile Trust Company, of New York, the Howard Savings Institution, and the National Newark Banking Association, of Newark, N. J. He was largely interested in various industrial enterprises, and was president or director in twenty-nine corporations, exclusive of those mentioned.

Cyrus Butler, whose death occurred on the 8th inst in New York City, was born in Norwalk, O., July 13, 1829. Upon the death of his father in 1844 he came to New York and entered the firm of William H. Cary & Co., general merchants, and was made a partner in the house in 1853. He was successful in business and about this time became a patron of the arts, especially of the works of American painters and sculptors. He subsequently became well known and a prominent amateur. Several years ago Mr. Butler retired from his old firm—which had been succeeded by that of Howard, Sanger & Co.—and became interested in mining and manufacturing at Ticonderoga and Lake George, where he conducted operations until his last illness. Mr. Butler was one of the charter members of the Union League Club, and was also in the Century and Nineteenth Century clubs.

INDUSTRIAL NOTES.

The steel mill of the Bethlehem Iron Company, at Bethlehem, Pa., which has been closed for a few days, resumed operations on the 8th inst. with 1,500 hands.

The machine shops of the Continental Tube Works, of Pittsburg, Pa., were burned on the 8th inst. The fire was caused by a sudden increased pressure of natural gas.

The five mills of the Oliver Brothers, at Pittsburg, Pa., are shut down, owing to the changing of the furnaces from the use of gas as fuel to coal. It is expected all will be again in operation by next week.

The Capital Railway Company of Atlanta, Ga., has applied for a charter. It proposes to build from five to seven miles of single track electric road. Frank Carter, 53 Old Capital Building, is in charge of the interests.

The Lehigh Coal and Navigation Canal is closed for the season. When the late cold snap came on there were 43 loaded boats ice-bound between Easton and Manch Chunk. These were all brought through by the aid of the ice plows.

Chicago's city council has granted permission to a company to lay pneumatic tubes in the streets of that city for the purpose of conveying packages from point to point, the tubes to be 12 inches in diameter and the charge per package to be 10 cents.

The Magic Introduction Company, of New York City, has just perfected a process for etching upon metal, by which manufacturers may indelibly affix their name or trademarks to machinery, tools, etc. A rubber stamp and a specially prepared fluid are the materials used.

The Consolidated Brake Adjuster Company has been organized at Chicago, Ill. Its object is to manufacture devices for adjusting the slack caused by wear of brake shoes. The capital stock is $500,000. The incorporators are Messrs. Charles F. Quincy, Arthur Crandall, and Richard W. Wright.

It is said that a Montreal surveying party has been operating at Niagara, and that the construction of a bridge will follow. On the Canadian side about 18 lots have been purchased, and land worth about $24,000 has been acquired on the New York side by a Buffalo trust company. It is rumored that the Canadian Pacific Railroad Company is the corporation interested.

It has been decided to place the affairs of the Bessemer Rolling Mill Company, of Birmingham, Ala., in the hands of a receiver. The company lost $30,000 by the recent failure of the United States Rolling Stock Company, of Chicago, which was the direct cause of the suspension. The company's mill has been in operation two years, and 600 men were employed. The receiver will try to keep the mill running, and though no statement of assets and liabilities has yet been filed, the directors state that the company will pay one hundred cents on the dollar.

The New York Board of Aldermen on the 9th inst. authorized the construction of the East River tunnel by a vote of 14 to 11. The tunnel, it is proposed, shall extend from Tenth avenue, under Forty-second street, to the East River, and thence to Long Island City, connecting the New York Central with the Long Island Railroad. The tunnel, as proposed, will be five miles long, and the estimated cost is $1,000,000 per mile, exclusive of the stations. Reference to this tunnel was made in the ENGINEERING AND MINING JOURNAL January 25th.

The committee of Pittsburg bankers appointed to investigate the financial standing of the Westinghouse Electric Company has finished its work. Its report is understood to be favorable. The committee determined that the electric company stocks are worth over $25 per share, and decided to advance the $500,000 recently requested by Mr. Westinghouse on condition that the parties making the loan have the privilege of naming the general manager for the company. The full board of managers of the Westinghouse company at its meeting on the 10th inst. resolved to request the stockholders to issue $3,000,000 of preferred stock.

The Board of Trade of Toronto, members of the Ontario government and representatives of the Grand Trunk and Canadian Pacific railways returned on the 11th inst. from a visit to the Sudbury nickel mines, which they inspected with the view of determining their importance in connection with the proposed establishment of nickel steel works in Canada. The Dominion and Ontario governments are being asked to bonus an extension of the Central Ontario Railway through to Sudbury to the extent of $1,500,000. They are also asked to pay the interest on $5,000,000 of capital stock for the nickel steel plant for ten years. It is said the extension of this railway to Sudbury will traverse iron bearing territory 100 miles in extent, and by connecting these great mineral deposits the assistance of the two governments will enable Canada to manufacture her raw materials and furnish nickel steel to European markets. The Dominion government now pays a bonus of $2 per ton upon the manufacture of pig iron. The enterprise is a gigantic one, involving the investment of more than $20,000,000.

The Westinghouse Air Brake Company recently held an adjourned annual meeting at Wilmerding, about 10 miles from Pittsburg, Pa., where it has bought a site and is building a town after the Pullman pattern. The new factory has cost some $500,000; 2,000 men are employed who manufacture 300 brakes per day. Mr. A. A. Folsom of Boston presided over the meeting, and Treasurer John Caldwell read the annual report, which showed gross earnings for the year of $3,929,119.27, and net profits of $1,350,998.50. Out of the latter, dividends of 16%, aggregating $800,000, were paid, leaving a surplus for the year of $550,998.50. The available assets foot up $3,550,000, and the unavailable $4,047,000, a total of $7,597,000. Included in this amount is $543,810 for the Ninth street building. The company has no debts or bonds, the liabilities consisting of the $5,000,000 capital stock and surplus fund. President Westinghouse said in a speech: The works were now turning out a complete brake every two minutes for each working hour, and doing a business at the rate of $7,000,000 a year. The annual capacity of the works might be increased to $10,000,000 without any additional outlay, and, if the demand exceeded this, the company had plenty of room on which to expand. The sales for October were $687,000; for November $637,000, and for the four months ended November 30th $1,800,000. The profits on the latter amount were $654,000, or at the rate of $2,000,000 net per year. At the election 76,085 shares were voted for the following ticket, which was elected: President, George Westinghouse, Jr.; vice-president, Robert Pitcairn; directors, George Westinghouse, Jr., Robert Pitcairn, H. H. Westinghouse, John Caldwell, T. W. Welsh, A. M. Byers and W. W. Card.

We are officially advised that the contract for what will be the largest electric mine haulage plant has recently been given to the Edison General Electric Company by the Loyal Hanna Coal and Coke Company, of Philadelphia, Pa. This plant will consist of one locomotive, capable of delivering hourly 129 cars to the bottom of the shaft, each car containing 2½ tons of coal. This would make the output 300 tons of coal per hour, and a total work of 375 ton miles per hour; the gross weight of the trains to be hauled will be 120 tons. About 3,000 feet of gangway will be equipped with conductors at the start, but as the lengths of the gangways increase this will have to be increased to 10,000 feet, and the company is then expected to put in a second locomotive of equal capacity to the one mentioned above.

At present the locomotive will work the entries to both sides of the main. As soon as it becomes necessary, however, to install the second locomotive, one will work the right and the other the left side entry, suitable signals being placed at the switches, so that each engineer, on approaching the main entry, can see at once where the other locomotive is, and whether it is safe for him to venture on the main or not.

The locomotive will, from the start, not only handle the largest output in coal, but will also make the largest number of car miles per day of any electric mine locomotive.

Plans and estimates had been submitted by all the leading companies, but after a careful examination of the same, necessary for a plant of such magnitude, the Edison Company was awarded the contract.

Owing to the great difference in the requirements of the various mine haulage plants the Edison Company has had under consideration or has contracted for, this company has found it advisable to design and build a number of standard locomotives, each of which is adapted for a certain amount of work, and for certain conditions. This policy enables the company to supply each mine with a suitable locomotive instead of having to adapt one single type to all cases.

MICHIGAN INDUSTRIAL NOTES.

The Lake Shore Iron Works is the name of a new corporation recently organized at Marquette, Mich., for the purpose of engaging in the manufacture of mining machinery. The company is capitalized at $100,000, with John W. Longyear, president; Peter White, secretary and treasurer; Seymour Holley, general manager. The concern will occupy the large factory at Marquette, vacated by the Iron Bay Company at the time of its removal to Duluth.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

1,173. Excelsior machinery. Texas.

1,174. Machinery for working gold quartz, such as a crusher, a mill to pulverize quartz, washers, etc. In fact all that is required for mining. Give description, capacity, and amount of power each machine will require; also prices, etc. North Carolina.

1,175. Drag saw, broom handle and chair machinery. Texas.

1,176. Phosphate mining machinery. Double drum winding machines, elevator platforms with safety attachment, etc., for vertical elevator

hoists, automatic tipple cars, ore crushers, washing and drying machines, pumps, boilers, engines, mining and smith's tools. Florida.

1,177. A saw and planing mill with a capacity of 50,000 feet per day. Connecticut.

1,178. Complete equipment for five miles of railroad for logging purposes. Connecticut.

1,180. Crusher and other machinery for a gold quartz mill. North Carolina.

1,181. A second-hand Blake stone crusher, 15 × 9. Pennsylvania.

1,182. Prices on sinking artesian wells. Georgia.

1,183. Planing mill outfit. Georgia.

1,184. Brick machines. Georgia.

1,185. Saw mill outfit. Georgia.

1,186. Machinery for cutting lime barrel staves from pine wood. Virginia.

1,187. Mica of a fine transparent quality. Pennsylvania.

1,188. Complete roller flour mill. Kentucky.

1,197. A 20 horse power engine, a 40 horse power boiler, machinery and tools for a canning factory. Texas.

1,198. All kinds of tanning tools. Texas.

AMERICAN GOODS WANTED ABROAD.

1,179. Prices and catalogues of hydraulic and other machinery for working diamondiferous alluvial gravels. Vaal River, South Africa.

1,189. Catalogues from the leading manufacturers of wire tramways. Mexico.

1,190. Price lists and catalogues of improved clay working and brick making machines. Mexico.

1,191. Catalogues from the leading manufacturers of rock drills. Mexico.

1,192. Catalogues and price lists of machinery for working the jute plant, *i. e.* Henequen o pita, which grows in considerable quantities in Argentine Republic.

1,193. Brushes. Argentine Republic.

1,194. Spades. Argentine Republic.

1,195. Forks. Argentine Republic.

1,196. Ice machinery. Argentine Republic.

GENERAL MINING NEWS.

ACME OIL COMPANY.—This company has filed a certificate with the Secretary of State at Albany, N. Y., reducing the number of trustees from five to three. The certificate is signed by John D. Archbold, F. Q. Barstow, Charles Pratt and Wm. Rockefeller as trustees.

ATLAS REFINING COMPANY.—This company has filed a certificate with the Secretary of State at Albany, N. Y., reducing the number of trustees from five to three. It is signed by John D. Archbold, F. Q. Barstow and H. H. Rogers as trustees.

STANDARD OIL COMPANY.—Certificates of the reduction of the number of trustees from five to three have been filed by this company with the Secretary of State at Albany, N. Y. It is signed by Wm. Rockefeller, Charles Pratt, John D. Archbold and Wm. H. Telford as trustees.

ALABAMA.

(From our Special Correspondent.)

The striking coal miners still hold out, and it appears that for the present the situation is likely to remain unchanged. Some of the operators are endeavoring to substitute negro miners. This has resulted in several race fights, with more or less bloodshed. At the Blocton mines 2,000 men were employed, all of whom have struck; efforts were made by a few of the conservative ones to get them to return to work, but without success.

On the 4th inst. nearly all the mine operators in the State held a meeting at Birmingham which resulted in the signing of the following agreement:

1. That we positively decline to advance the price of mining.

2. That we positively decline to recognize or confer with the executive committee of the United Mine Workers of America.

3. That we will, in accordance with our past custom, always meet a committee of our own men, appointed by our miners, to discuss any differences which may exist between us.

ARIZONA.

COMMERCIAL MINING COMPANY.—This company has been incorporated by the New York Secretary of State; the capital stock is $2,000,000. The company is formed for purchasing and developing mining property and the treating of metals. The company will have its principal office in New York, and will carry on its operations in the Territory of Arizona. The trustees of the company for the first year are George Notman, of Brooklyn; Edmund Coffin, Jr., and Charles W. Parsons, of New York City; William J. Hunt, of Jersey City, and Joseph Van Vleck, of Montclair.

ARKANSAS.

The geological survey of Arkansas has been giving attention during the last two years to the study of some of the most important of the mineral resources of that state. The Survey has now in press separate volumes upon the following subjects: 1. Manganese. 2. Coal. 3. Marble. 4. Novaculite. 5. Clays and Kaolins. 6. Crystalline Rocks, besides others on special subjects and localities.

The marble field has been found to cover a large part of the region north of the Boston Mountains. More than a thousand miles of outcrop have been traced out and mapped. These marbles are susceptible of a high polish, are of several shades of red, pink, and are variegated, and compare favorably with the famous Tennessee marbles.

The report on manganese will embrace descriptions of all the known manganese deposits in North America, all of which have been visited by Dr. Penrose, the assistant having charge of this part of the work.

The novaculites, or whetstone and razor-hone rocks, have been outlined in detail, and their entire distribution will be given in the forthcoming report.

The waters of the famous hot springs have all been analyzed by the survey in connection with the study of the crystalline rocks.

The complete report on the coals of the state will finish the work on which a preliminary report was made in 1888. The coal industry of Arkansas is growing rapidly, and since the recommendations made by the Geological Survey, two years ago, two of the principal mining companies have put up breakers, and within a few days these semi-anthracites will be marketed as screened coals.

CALIFORNIA.

AMADOR COUNTY.

(From an Occasional Correspondent.)

RIVER GOLD.—These mines are situated at Big Bow Bridge, on the Mokelumne River. They are owned by R. W. Petre and H. T. Tripp; the latter, who superintends the mine, is erecting hoisting works an the Kearsing vein, which in early days of quartz mining produced rich rock. During the past summer a good deal of prospecting was done on the north end of this vein, and within 20 feet of the surface some $12,000 were taken out of a decomposed seam in the quartz. All the surface ground and broken lead matter were hauled by wagon and crushed in the ten-stamp mill, at a total cost of mining, milling and depreciation not exceeding 60 cents per ton. Even when working the parallel lead, the Alison, where the quartz is very hard, the total cost is never over $1.25 per ton. One of Tulloch's new canvas-belt concentrators is being put into the mill prior to starting up on Alison quartz, which carries a high percentage of sulphurets at the present level. With attention one Tulloch machine will handle the pulp of ten stamps, and save sulphurets very closely. We consider this concentrator worthy of attention.

NEVADA COUNTY.

ONONDAGA MINING COMPANY.—This company has been formed with a capital stock of $1,000,000. Shares $10 each. The directors are John F. Kidder, Edward H. Brown, George Fletcher and M. L. Elliott, of Grass Valley, and J. B. Wright, of Sacramento. The first work of the company will be the prospecting of the Manhattan claim.

SONOMA COUNTY.

Advices from Healdsburg state that the recent rapid rise in the price of quicksilver has greatly stimulated mining in this district. It is said that there are large deposits of high grade cinnabar. Several new claims have been located in the Pine Flat Ridge country, and companies are being formed for the purpose of working deposits.

Natural gas has been discovered 500 yards from the Donahue Railroad, two miles north of Sonoma. The flow of gas is said to be 9,000 feet every 24 hours. The well has now been bored to a depth of 36 feet. The hot water struck is 110°.

COLORADO.

Speaking of the World's Fair mine at Chicago, says a Denver exchange, Mr. H. B. Gillespie, who has been one af its principal promoters, says: "As to the mine itself the main shaft will be 500 feet deep. Drifts will run in various directions representing the different districts of our State. We will have a miniature Leadville, a model Aspen, a representation of Pueblo and every one of the mining places of Colorado. All the big mines will be modeled with their workings and the ore will be the genuine article from the mines named. The mine proper will be made large enough to receive 75,000 people a day. Six large elevators, something after the mine cage, but a little more elegant, each capable of holding 40 people, will run continuously during the day.

(Special Report for the ENGINEERING AND MINING JOURNAL.)

Mineral surveys approved by the U. S. Surveyor General of Colorado, during the week ending December 6th, 1890:

Survey No. 6700, land district, Gunnison, name of claim, Christopher Columbus lode; 6699, Leadville, Bonanza and Me Too; 4643, Montrose, Gray Copper; 6731, Central City, Fannie; 6614, Leadville, Dunderburg; 6615, Leadville, Blue Blazes; 6675, Garfield, Silver Purse; 6535, Del Norte, Servia, Aurania, Pavonia, Umbria and Etruria; 6751, Central City, Organ; 6722, Central City, Jupiter; 6580, Garfield, Adalade; 6622, Garfield, Parnell.

CLEAR CREEK COUNTY.

BELLEVUE-HUDSON MINING COMPANY.—This company has recently filed articles of incorporation. The stock is placed at $100,000. The principal office is at Denver. The directors for the first year are Chas. Pence, Hugh Mackay, Wm. Harvey, Jno. Cross and L. M. Petitdidier.

GILPIN COUNTY.

BATES HUNTER.—This mine's November report shows that the main shaft has been sunk 30 feet. The seventh level has been driven west 17½ feet, the seventh level stope west 16 fathoms. The shaft struck the crevice 10 feet higher than was expected. The eighth level plat has been cut and the level started on the vein. The crevice is now 2½ feet wide on hanging wall of shaft. Near the shaft at seventh level the crevice was not more than 8 inches wide. Sinking operations will be completed soon and the contract let to drive the eighth level west. This will give 175 feet of solid ground between sixth and eighth levels. The month's output was as follows: 51½ cords of mill ore, $955.70; 41¼ tons tailings $756.23; 43½ tons smelting ore, $1,486.70; total, $3,198.63.

GOLD AND SILVER EXTRACTION MINING AND MILLING COMPANY.—This company has purchased the site of the old Bailey smelter, Denver. A force of men is at work teaming away the old furnaces and clearing the ground for the new plant. The works will be completed in four weeks. A small plant has been operated successfully at Thirtieth and Blake, but for continued operations upon a scale of practical value the new move is necessary and a 10-ton plant will be put in.

PITKIN COUNTY.

It is stated that the Aspen car famine, to which reference has frequently been made by the ENGINEERING AND MINING JOURNAL, is over. It is now only a question of time till the railroads will be up with their orders and endeavor to keep ahead of the shippers. It will then tax the mines to keep the cars full and on the road. One of the most serious difficulties occasioned by the shortage of cars was the packing and the freezing of ore in the bins, rendering it hard and expensive to handle.

Advices from Denver state that Jack Haughton, John Waters, Charles George, F. G. Ford and W. H. Ford have been arrested at Aspen for the alleged stealing of ore from the Acquisition Mining Company. It seems that these parties held a lease of the Missouri Boy mine, and according to reports worked a lead of ore on that company's property through a "hidden" shaft, and marketed it as Missouri Boy ore. The amounts netted are estimated to approximate $15,000.

ARGENTUM-JUNIATA.—In cutting the station for the new pump for use in this incline it is necessary to run in toward the vein, the incline being under the contact, and this opens loose ground which runs in upon the least provocation. The work has to be kept timbered closely and it consequently is very tedious. Water courses are met with frequently. The station is to be 60 feet in length and 35 feet of it is required to be cut 20 feet high and 15 feet wide.

BUSHWHACKER.—The mine has been closed down pending repairs to the shaft. Soon after the shaft was sunk a drift was run up to it from the Park-Regent. At this point the timbers have swelled and the shaft has become somewhat dangerous. The timbering is being torn out for 20 feet, and this work will cause a delay of a week or ten days. The ore opened in the third level was found to extend 31 feet. For 10 feet it is three feet thick, the remainder being a foot in thickness on an average.

EMPIRE MINING COMPANY.—According to the Aspen *Chronicle*, Mr. P. Fitzgerald has turned over his lease of this property to Charles B. Gentry & Co. The original lease covered thirteen twenty-fourths of the property and had eight months to run. It is generally conceded that greater depth must be attained before the mine will be a valuable one. The present depth is 450 feet. The new management has entered into possession, and will probably put in a heavy hoisting plant.

GOOD THUNDER MINING COMPANY.—Ore was first struck in the shaft in this company's mine at a depth of 412 feet. The shaft was sunk for the purpose of striking the vein disclosed in the Edison, the adjoining claim. It was struck at a point where the ore bulged; from this point it was found to pitch to the east. The management decided to sink the shaft and tap the mineral by a cross cut. In the meantime lateral development was pushed at the 412-foot level; this has opened up ore in every direction. The shaft has been sunk 45 feet below the 412 foot level. At 36 feet below the level a drift has been run to the southeast. This struck the ore a few feet from the shaft. The contact at this point has the regular northwest dip and pitches nearly 70°. This will bring it to the shaft at about 15 feet below the present bottom.

The south end of the property is said to be looking almost as well as the other.

JUSTICE MINING COMPANY.—Important developments have been made in this company's mine 350 feet southwest of the shaft. This chute appears to be entirely distinct from all others opened in the same district. It is now being blocked out. There is said to be a large body of low grade ore.

LITTLE RULE MINING COMPANY.—It is said that this company, in its south drift, has struck the same lead of ore which was shown in the "Driver upraise" some time ago. Reports state it is from two and one-half to three feet thick, and solid.

QUEEN SABE.—This tunnel is a continuation of the Old Dick tunnel. The company owns a group of claims, in which are included the Dick and Queen Sabe. The latter had the regular northwest pitch, although the formation was considerably broken, and estimates were made that about 1,000 feet would cut the vein. The tunnel is now in 1,350 ft., or nearly through the Queen Sabe ground. It runs diagonally across the Queen Sabe and has cut into the claim about 300 feet. Another hundred feet and the east side line will be reached. Its face is still in porphyry with no sign of a change. This porphyry is characterized by hard ribs. From the outcrop it was expected that the vein would have been cut some time ago. The explanation given is to the effect that some distance below the outcrop the formation dips to the east, instead of standing nearly perpendicular as was expected. The Queen Sabe holds the outcrop for 1,500 feet.

THE ASPEN MINING AND SMELTING COMPANY.—From the annual report of General Manager Fred G. Bulkley, of this company, for the fiscal year ending December 1st, 1890, read at the stockholders' meeting on Tuesday, we condense the following:

The company had a cash balance of $79,955.90 on December 1st, 1889. On December 1st, 1890, the actual surplus, deducting November expenses, was $127,105. The gross value of ore product was $720,851.13. The number of net tons sold was 15,652·90; ounces of silver, 675,555; pounds of lead, 4,351,543. The average assay value of the ore per ton was 42·57 ounces of silver, and 13·20% lead.

During 1889 an average force of about 165 men were employed in the mines, and during 1890 the average force employed was 145 men. During the year 6,532 feet of development work was performed at an average cost of $5.09 per foot, a saving of $3.90 per ton as compared with expense for 1888, and $1.42 per ton as compared with expense for 1889, a total improvement of about $25,000 over last year in the total of expense.

The general plan of development of the company's mines proceeded actively during the early portion of the year, but met with a very serious interruption on the 9th day of May, at which time, suddenly, within the space of a few hours, all the workings below the level of the Veteran Tunnel were filled with water and rendered inaccessible. The volume of water came into the workings under circumstances which would indicate the sudden release of a neighboring subterraneous reservoir, the magnitude and violence of the flood being, for a period of three weeks, beyond the capacity of any practicable pumping plant. As a further result, the pumping plants of their neighbors were submerged and rendered incapable of work. As they have depended for the drainage of their lower levels upon these plants, and as pumping operations have only just been resumed, their lower levels still being flooded and preventing development of any other kind of work below the Veteran Tunnel level for the greater part of the year, it will easily be understood that not only has the exploration and development of virgin ground in the most promising localities been absolutely prohibited, but the product of the mines has also been cut down very materially, both in point of tonnage and in values, their richest ore bodies being in the flooded territory.

During the year an electric generating plant has been put in operation. Two Thomson-Houston five hundred volt, eighty ampere constant potential dynamos were purchased and set up. Heavy, bare copper wire conducts the electric current from the dynamos to the mouth of the Veteran Tunnel, and thence underground, over heavily insulated waterproof cables, to hoisting machines, located at a distance of about a mile and a half from the source of power.

At the mines there are in operation two ten-horse power hoisting machines operated by Sprague motors, and one five-horse power Sullivan Diamond Drill operated by a Thomson-Houston motor. All the main tramming avenues of the mine are lighted by incandescent lamps. In addition to the machines already in use, there is in process of construction one twenty-five-horse power machine to be operated by a "C & C" motor, which will be employed in raising ore up one of the inclines. The advantage of electric lighting from the same current which supplies power is also marked.

The area of the company's territory has been augmented by the purchase of eighteen acres of land included in five patented lode mining claims. The total area of mining ground now owned by the company amounts to eighty-eight acres.

SAN JUAN COUNTY.

ORLEANS SILVER MINING COMPANY.—This company has been organized with a capital stock of $50,000, shares $1 each. The board of directors is constituted as follows: Messrs. J. V. Kersburg, Sanley E. Filkins, George T. Case, C. A. Gorman and George Spooner. By the formation of the company the following properties are consolidated: Mineral Key, Ida and Orleans lodes, all of which are in the Las Animas Mining District in the San Juan. The office of the company will be located at Medina.

GEORGIA.

LUMPKIN COUNTY.

General Murray is having a cut opened on the hill above Yahoola bridge on the Miller and Ripley property.

VICTORIA.—Mr. H. R. Horner has been making tests of the ore from the main shaft, and finds that the large losses occur in simple milling from the partial occurrence of the gold in sulphurets. This will necessitate concentration and a subsequent treatment either by smelting or chlorination.

OGLETHORPE COUNTY.

LEXINGTON BLUE GRANITE COMPANY.—Judge Hamilton McWhorter, of this company, has sold the Georgia, Carolina & Northern Railroad 200 car loads of granite from the Blue Granite quarries. This contract will cause the quarries to be opened on a large scale.

IDAHO.

Dr. David T. Day, of the Geological Survey Department of Mineral Statistics, is reported to have said, in reference to the coal fields of Idaho, that "numerous reports have been published as to the discovery of available coal beds in Idaho, but no reliable facts have been ascertained in regard to any accurate development in any special locality. That several coal beds have been found at different points and have been worked for local consumption at different times, is well known, and has been referred to in numerous government reports and trade journals, but all that can be learned about the coal is that it is of such inferior value as to prevent its development as a fuel either in competition with other coals, which can be brought into Idaho, or with wood which can be cut in most localities in which the coal has been found. Mr. F. F. Chisholm, of Denver, Colo., has visited a number of localities in which good coal has been reported to be found and reports the coal in all of them to be worthless. On the Wood river he reports the occurrence of a form of graphite. The products from the beds in all these localities are reported as worthless."

ALTURAS COUNTY.

MODOC CHIEF MINING COMPANY.—This company was organized a few months ago and work has been prosecuted under the superintendency of J. C. Cunningham, the original owner of the property. A tunnel was run in 308 feet when the ledge was tapped. After cutting through the hanging wall a seam of clay or talc 18 inches thick, said to assay 70 ounces silver and 54% lead, was reached. Inside of this lining there was 22 inches galena, assaying over 100 ounces silver and 65% lead. A drift was run east next to the hanging wall 20 feet on the ore body. Another drift has been started westward; this is partly in spar mixed with ore.

RED CLOUD MINING COMPANY.—A controlling interest in the Red Cloud mine was purchased last spring by this company. The incorporators were Messrs. Price, True, Lemmon, Mason and the Porter brothers, of Hailey, Idaho, and several Pittsburg capitalists. The stock is $150,000. The first dividend of $10,000 was paid October 15th, the second one of a similar amount on November 15th.

ILLINOIS.

CENTRAL COAL COMPANY.—Mr. Jacob Wheeler has been appointed receiver of this company of Springfield, upon the petition of Edward Whitaker, of St. Louis, who holds a mortgage given to secure payment on $50,000 in bonds. The company, it is said, defaulted on payment, hence the foreclosure. The mine has been leased for eight months and has been operated by the Wheeler Coal Company. Mr. Jacob Wheeler, president of the company, has been appointed receiver. It is thought that operations will not be suspended.

INDIANA.

Natural gas companies furnishing gas to Indianapolis have cut off the supply to all factories for the winter. Superintendent Pearson, of the Indianapolis Company is reported to have said: "I believe that natural gas will be exhausted in the course of a few years at the present rate of consumption. Some radical measures should be taken by the legislature to economize its use."

KANSAS.

CHEROKEE COUNTY.

A special report shows that during the week ending December 6th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 2,880,560; zinc ore, pounds sold, 789,540; lead ore, pounds sold, 150,000; sales aggregated a total value of $12,584.95, and the total value of the output was $16,000.

KENTUCKY.

CARLISLE COAL COMPANY.—This company has been incorporated by John Carlisle and others, with a capital stock of $100,000, for the purpose of developing coal mines in Kenton County.

MICHIGAN.

COPPER.

Navigation closed on Portage Lake the first of last week. The steamer "W. H. Stevens," loaded with supplies for the Calumet and Hecla Mining Company, attempted to effect an entrance on the 3d inst., but was deterred by four inches of ice. The cargo was unloaded at L'Anse, Mich., from which pointit was forwarded by rail.

Agent Vivian of the Franklin, Huron, Centennial and National mines arrived in Boston to-day, says the Boston *Herald*. His errand, he says, is to have a hearing with a Mr. Gray, who has patented an operation for getting the copper from the sand after it has passed through the mill. The process is by electricity. Mr. Gray will accompany Capt. Vivian back to Houghton county, where his invention will be given a trial. Few will place much value on the invention until its efficiency has been demonstrated, for these devices have been tried and failed so often already.

CALUMET & HECLA MINING COMPANY.—The directors of this company have held their December meeting, and, contrary to expectation, failed to declare a dividend.

CENTENNIAL MINING COMPANY.—No. 3 shaft of this mine is not showing well, says the Calumet *News*. From the No. 4 shaft, at the tenth level, a drift is being run south. From the ninth level a winze has been sunk to the tenth level, from which a drift is being run south also, with the expectation apparently of reaching No. 3 shaft by the time the drift from No. 4 shaft is holed at the bottom of the winze. This drift is in good ground, and it and the one above will furnish some very good stopes. The ground at the bottom of No. 6 shaft, which is now down to the third level, is improving. Drifting will, we believe, be started there shortly. The ground in the drift going north at the first level, which is now in several hundred feet, varies considerably. Lately the ground has improved. The lode at present is about 10 feet wide, five of which are well charged with copper. One great trouble appears to be the slip, which is encountered on the footwall side, and which will have to be mined to get down the good rock. The second level north is in some 175 feet, and is looking well. The south drift does not make a very good showing at the present time. It is generally reported around the mine that this will be done in the early spring.

FRANKLIN MINING COMPANY.—The three stockholders who were to work with the directors of this company in the purchase of the Pewabic property have been appointed, but there is said to be a disinclination to disclose their names.

HURON MINING COMPANY.—This company's product for November was 85 tons. This compares with 95½ tons for October and 89¼ tons for September.

KEARSARGE MINING COMPANY.—This company produced 80 tons of mineral in November, against 75 tons in October, and 91¾ tons in November last year. This makes 818 tons produced since January 1st, against 943 tons in 1889, a decrease of 125 tons.

OSCEOLA CONSOLIDATED MINING COMPANY.—The production of this mine for November was 305 tons of mineral, against 300 tons for October, and 232¾ tons for November, 1889. For 11 months the production has been 2,679 tons, against 2,407 tons in 1889, an increase of 272.

PENINSULA MINING COMPANY.—This company's output during November was 61 tons; a total of 611 tons since January 1st, 1890.

TAMARACK, JR., MINING COMPANY.—According to latest advices this company had not struck the Calumet conglomerate. It was expected to reach it at 2,500 feet. The present depth of No. 1 shaft is 2,520 feet. The Tamarack, Jr.'s officials account for the situation only in the ground that the lode runs in rolls. They expect to strike it at any moment.

GOLD.

MICHIGAN GOLD COMPANY.—This company, concerning the property of which a detailed description was published in the ENGINEERING AND MINING JOURNAL, July 5th, will hold its annual meeting in Marquette January 6th. It is said that one of the results of this meeting will be the removal of the main office from Cleveland, O., to Marquette, Mich. A building is being constructed for the compressor, and other surface improvements are under way which, when completed, will conduce greatly to expediting the development of the mine. The main shaft is down 150 feet. Fifteen men are employed. Work is confined to sinking and drifting.

IRON.

ASHLAND IRON MINING COMPANY.—The Westinghouse Electric and Manufacturing Company has just completed the installation of an electric light plant at this company's mine. To insure good insulation the wires were drawn through Simplex insulating paint and only the best Okonite wire was used in the entire plant. The plant has a capacity of two 300-light Westinghouse machines.

(From our Special Correspondent.)

GOGEBIC RANGE.

HURLEY, Dec. 10.

COLBY.—At the old workings on this property, the pillars, which were left to sustain the surface capping, are being removed, and the surface will be allowed to "come in." No exploring work of importance is being carried on on this part of the property, although it is probable that the dike, on which the ore lies, will be penetrated and the ground underneath explored by diamond drill. The mine has a mile of territory on section 15, on which comparatively little work has been done during the past four years. During this winter the bulk of the work will be confined to this part of the property. Four diamond drill holes have been put down on the West half of section 15, the

deepest 875 feet from the surface. While the results shown by the ores obtained are not made known, the work which is being undertaken gives assurance that the drill work was satisfactory. Three new shafts are already begun, and a fourth shaft will be sunk deeper during the winter. This shaft, called Old No. 8, has been pumped out preparatory for sinking. It measures 7 by 10 feet, and is already 200 feet deep. The three new shafts will be known as New Nos. 6, 7, and 9. No. 6 is already down 207 feet; No. 7 is 55 feet, and No. 9 is ready for starting, awaiting new machinery. The new shafts are each 7½ feet by 18 feet in the clear. An Ingersoll-Sargeant compressor with capacity for 15 drills has been ordered for sinking shafts 8 and 9. A new dry-house, 24 × 100 feet, two stories high, and a model in excellence, has been erected. It will accommodate 450 men. It is heated be steam, and lighted by electricity. The Colby has about 20,000 tons of ore in stock and is taking out 800 to 900 tons a day from the old workings.

(From our Special Correspondent.)

MARQUETTE RANGE.

GRAND RAPIDS MINING COMPANY.—A fine body of ore was struck at the depth of 140 feet in shaft A of this company's property, on Thursday morning of last week. During the past season the mine produced 27,000 tons. The success attending the sinking of shaft A will enable the mine to nearly double its output next season.

VOLUNTEER IRON MINING COMPANY.—With 70,000 tons of unsold ore on its hands this company has determined upon a considerable reduction of its winter working force. About one-third of the force will be retained. The Volunteer's production for 1890 is 140,000 tons.

MINNESOTA.

ST. LOUIS COUNTY.

MESSABA RANGE.

(From our Special Correspondent.)

SOUDAN, Dec. 8.

MALLMAN.—This property is showing up finely. Several shafts are in ore of good quality and are now stocking ore. A spur track is being run in to the property from the Duluth & Iron Range railroad. Mr. Mallman has also done some exploring to the northward of his mine with encouraging results, and a company has been organized to develop this portion of the property.

MESSABA SYNDICATE.—This company has recently commenced explorations in Sections 31 and 32-60-13. Twenty men are at present employed in test-pitting. The company owns 8,920 acres on the direct trend of the formation, northeast from the Mallman property that has attracted so much attention lately. The iron-bearing formation has been traced for over four miles upon the company's lands. The officers of the company, so far as they have been chosen, are: A. J. Trimble, John McKinley and Mr. Shannon; executive committee: D. B. Brown, secretary and treasurer, and Capt. W. H. Wicks, superintendent.

STONE IRON COMPANY.—Work has been discontinued at the camp near Messaba station, as the results were not encouraging, and the excessive amount of water rendered the work of sinking exploration shafts very expensive. The company has recently made a new find on Section 18 and at present its operations are confined to this locality. Surface indications are not very promising, however.

VERMILLION RANGE.

ANDERSON.—Capt. Bale is exploring on this property, with a force of twelve men. The prospects so far are excellent. Test pits twenty-eight to thirty feet deep have been dug in a first-class quality of ore, resembling the Chandler ore. The property is located in Section 4-62-12 (about one and a half miles southwest of the Chandler mine). At present a shaft 12 feet × 7 feet is being sunk in the foot wall, on the south side of the swamp, with the intention of drifting northward under the swamp, as soon as depth enough is reached to give a firm roof. The surface is quicksand. The shaft is now about 42 feet deep, the last ten feet or so being jasper with about two-thirds ore. The formation seems favorable to the supposition that there is ore in the swamp. There is a high wall on either side, very uniform, and equi distant for a considerable distance. These walls are of slaty rock, red at the bottom, as is also the bottom of the swamp, the water, etc. They have a pump and a small hoisting plant.

MINNESOTA IRON COMPANY.—The exact figures for the shipments of this company for the season just closed are 532,277 tons, of which about 75% is Bessemer ore. Explorations have been commenced on sections 26 and 29. Test pitting is all that has been done as yet, but it is probable that a diamond drill will be used on section 26. A new landing platform, trestle and pocket are to be built at No. 3 shaft this winter. A new lense of ore has been discovered with the diamond drill 150 feet below the present bottom of the Montana shaft, and a little to the west of it. Previous to this discovery the Montana mine was supposed to be nearly exhausted.

SECTION 25-62-12.—A crew of men is exploring here under Capt. Trezona. Ore has been found with the diamond drill, a shaft has been sunk, and at present they are drifting.

MISSOURI.

State Labor Commissioner Lee Meriwether has made his annual report on the mining statistics of the State. It shows that for the year ending June 30th, 1889, the total value of the State's output of lead, zinc, iron and coal amounted to $7,937,674. In the year ending June 30th, 1890, it amounts to $8,165,865, an increase of $228,191. There were, during the year 1890, 7,698 persons employed in mining coal; as the selling value of the coal mined during that period was $3,234,351, the average value of coal produced during the year, per employé, was $420. The average value of lead and zinc produced, per employé, during the year was $930.

(From our Special Correspondent.)

JASPER COUNTY.

Messrs. John Harlan and H. Hubbart, bankers, of Sarcoxie, called at the ENGINEERING AND MINING JOURNAL's Joplin office to-day. From them your correspondent learned that Sarcoxie is located in the southeast corner of Jasper County, about 25 miles from Joplin. Considerable zinc ore has been produced and shipped to Collinsville, Ill. The noted Baker mines, six miles south of the town, are well developed, and are putting up a fine plant of machinery.

Holibaugh & Stanley, the mining and civil engineers, have just completed a new map of part of the lead and zinc mines of Jasper and Newton counties, Mo., and Cherokee County, Kan. A heavy fall of snow will retard mining operations this week.

JOPLIN, Dec. 8.

The sales of zinc ore for the week ending Saturday were light in comparison to the output. The average price paid by the buyers was about $27 per ton. Lead ore declined and was sold at $26 per thousand. We are informed that the Swansea, Wales, ore buyer is negotiating for a large shipment, and that as soon as satisfactory freight rates can be arranged to the Gulf or Atlantic Ocean he will be in the market for a large amount of zinc ore. Following are the sales from the different camps as far as reported:

Joplin mines, 1,199,450 pounds zinc ore and 200,740 lead; value, $21,373.

Webb City mines, 573,750 pounds zinc ore and 51,935 lead; value, $8,934.

Carterville mines, 826,110 pounds zinc ore and 100,520 lead; value, $13,701.

Zincite mines, 213,500 pounds zinc ore and 13,560 lead; value, $3,327.

Oronogo mines, 82,550 pounds zinc ore and 12,190 lead; value, $1,433.

Lehigh mines, 43,810 pounds zinc ore; value, $638

Galena, Kans., mines, 1,041,540 pounds zinc ore and 126,800 lead; value, $12,584.95. All districts, total value, $62,454.95.

Snyder Bros. now have their bins all full of fine ore and a sale pending of the same to the European market.

EMPIRE ZINC COMPANY.—This company's smelter is turning out about 18,000 pounds of spelter every twenty-four hours. Mr. Hexter, president of this company, will arrive in Joplin on Tuesday morning from Philadelphia and spend some time in inspecting his mine interests.

PORTER.—This valuable tract of property, located in Joplin Creek valley within the city limits on the east, is proving up some large bodies of zinc ore. A large concentrating plant is running, cleaning the ore from two shafts.

LAWRENCE COUNTY.

(From our Special Correspondent.)

AURORA, Dec. 5.

Having heard much of the great production of the lead mines of this district the JOURNAL correspondent spent one day in looking over this camp's resources and securing the available statistics as to the output. The prosperous city has almost 6,000 inhabitants, all depending on the mining industry. It is a typical mining camp.

The first mines were opened in this camp about three years ago, when lead in large quantities was found on the surface of the ground, attracting the attention of the miners from other camps, who came in and commenced prospecting. Almost at the surface they found large deposits of carbonate of lead, locally called dry bone. Besides the lead finds large deposits of willemite zinc silicate was encountered, so that to-day the Aurora district may be called one of the largest producers of lead and zinc silicate in southwest Missouri. Moreover, as development has advanced large deposits of sphalerite, zinc blende, had been opened up at a depth of 125 to 145 feet. The zinc ore is found in two forms, free and disseminated. In the disseminated ore I find the ore associated with a gangue of schist rock, magnesian limestone and calcite. The free ore is found in a crystallized form, and is certainly of a high grade. A collection of specimens from this camp in Messrs. Plumb & Miner's office shows the various formations of the lead and zinc, together with a large number of fossils and the gangues of the ore. On another visit to this camp I will investigate the output and underground workings.

(Special from Aurora.)

The output of the mines for the week ending Saturday was 108,000 pounds lead, 110,000 pounds zinc blende and 665,000 pounds silicate. It sold for $9,156.

MONTANA.

ANACONDA COMPANY.—The bricklayers engaged in constructing the smelter smokestack located on the foothills near the company's smelters at Anaconda have struck for an increase of $1 per day. They had been receiving $6. Advices from the district state that this action virtually closed down the lower works and decreased by fully one-half the capacity of the smelting works for handling ore and necessitated the closing down of a number of mines.

BEAVER HEAD COUNTY.

LEGAL TENDER.—When the incline shaft was being sunk on the Legal Tender, it seemed to be on a lead dipping about 30° from the perpendicular. More recent developments, it is said, have proved that it was a "horse" of limestone between two ore bodies. When the hoist was put in a new ore body was discovered under it. At the 100-foot level a crosscut was run to the ore body under the hoist. The lime was cut and found to be about 12 feet thick, and made up of broken pieces surrounded by lead matter. The ore body under the hoist was found to be about 12 feet in thickness. A drift to the west struck a porphyry wall, which is thought to be the hanging wall of a very large lead. The drift here is 100 feet from the porphyry wall, but the other wall has not been found. The ore is also 100 feet along the porphyry wall, excepting the lime "horse." On the 200-foot level a crosscut was run to the west and then a drift was started for the ore body north. At 145 feet a drift has been started on the ore to the east of the shaft, which so far has gone about 12 feet in the fine carbonate. (For further data concerning this mine, see ENGINEERING AND MINING JOURNAL, June 28, 1890.)

DEER LODGE COUNTY.

BI-METALLIC EXTENSION MINING COMPANY.—This company has been organized about a month. As the name implies, it is a western extension of the Bi-Metallic Company's ground. The Shoo-Fly claim, where the present development work is being so vigorously prosecuted, adjoins the Bi-Metallic ground on the west. As is the case on the original granite location, there seems to be a regular network of small quartz veins running parallel with the two great north and south veins, and altogether the Extension Company's shaft is fully 50 feet south of the north bonanza lead and at a depth of about 40 feet. It has several small stratas of quartz that are gradually widening as depth is attained, proving the complete mineral character of the ground. A two-compartment shaft is being sunk. No water is expected above the 150-foot level.

JEFFERSON COUNTY.

RUBY MINING COMPANY.—Two months ago this company purchased the Ruby mine. At the time the shaft was down 130 feet. After running 20 feet a body of gray carbonates was struck. An uprise was then made, and it was demonstrated that pay ore extended to within 25 feet of the surface. The ore assays from 50 to 100 ounces in silver and 35 to 45% lead.

MALISON COUNTY.

BEDFORD CONSOLIDATED MINING AND SMELTING COMPANY.—This company has filed articles of incorporation. The capital stock is $1,750,000, shares $5 each, the stock to be considered fully paid up and non-assessable. The principal office of the company is to be at Virginia City, or at some other point in Madison County as the trustees may elect. The company has secured control of the Bedford group, on the Ramshorn, and which will be made the central point of operation.

MISSOULA COUNTY.

CURLEW.—The new concentrator has been in operation about two weeks, and is said to be doing excellent work. The Curlew has shipped some 300 tons of crude ore during the season, which has returned approximately $50,000. It is said that fully 10,000 tons of concentrating ore have been accumulated on the dump during development. A. M. Holter and S. T. Hauser are prominent among the owners of the property.

SILVER BOW COUNTY.

Messrs. Mills and Ely have taken a lease and bond on the Moody and Sankey group of mines, lying north of the Parrot Champion. The group consists of the Moody and Sankey fractional Kossuth and Iowa full claims. The amount of the bond is said to be $80,000.

ANACONDA COPPER COMPANY.—The work of replacing the burned timbers in the Anaconda mine is progressing as rapidly as the situation will admit. It will be some time, however, before the mine will be thoroughly retimbered throughout. All the pumps, column pipes, ore cars, etc., to which the action of the water proved so disastrous, have been removed and will be replaced with new material. Before the fire the output of the Anaconda was 1,000 tons per day. About 250 tons per day are now being raised from the upper levels. No ore whatever is being hoisted from the St. Lawrence. The work of cleaning up the levels and replacing the burned timbers is being prosecuted. It is said on good authority that there are now 500 men at work in the two great properties, and 1,000 more at the syndicate mines.

BUTTE & BOSTON MINING COMPANY.—This company's new 400-ton concentrator at Butte has started up. It will reduce ore from the Silve

Bow exclusively, for a time at least, a tramway having been built from that mine to the mill. The company is building a smelter at the Great Falls.

COMBINATION MINING COMPANY.—It is said that this company's mine at Black Pine has been closed down. It is reported that there are 300 tons of ore in the ore bins and a large quantity in sight in the mine. Mr. Akers, the superintendent, has stated that the affairs of the company are in a prosperous condition. It is out of debt and has plenty of capital on hand. It owns twenty-two mining claims at Black Pine, part of which are patented, and applications have been made to procure patents for all the others. During the past year the company has expended not less than $30,000 in improvements.

Concerning the shut down, the Butte *Miner* publishes the following: The closing down of the combination property seems to be shrouded in an impenetrable mystery, but it is not, so rumor says, so deep and dark as it might be. There is in reality a scheme on foot to sell the entire property to a St. Louis syndicate, and pending the negotiations for the sale the management deemed it advisible to close down.

NEVADA.

(From our Special Correspondent.)

STOREY COUNTY—COMSTOCK LODE.

SAN FRANCISCO, Nov. 6.

CROWN POINT MINING COMPANY.—An assessment of 50 cents per share was levied on Wednesday ostensibly for the purpose of clearing off an indebtedness and carrying on the draining operations. The pumps are still working well and almost as fast as one is set and working the other has to be lowered. The water is out of the 1,600 level of this and adjoining mines and is being steadily lowered in the incline to the 1,700 level.

KENTUCK MINING COMPANY.—On the 17th of the current month a special meeting of this company will be held to decide upon the proposition to increase the capital stock from $3,000,000, divided into 30,000 shares of the par value of $100 each, to $10,500,000, divided into 105,000 shares of the par value of $100 each. Since its organization the company has paid $1,350,000 in dividends and levied thirty-nine assessments aggregating $405,930. The mine recently passed into the control of Hon. J. P. & S. L. Jones, who elected a new board of directors and appointed H. M. Gorman to the position of superintendent.

POTOSI MINING COMPANY.—This just at present is the mine of great expectations. So far, however, the newly started east cross-cut north of the winze station, 1,130level, is not far enough in to reach the point where ore is expected to be found. The drift coming north from the Chollar incline, 1,230 level, is showing well with its face in quartz, giving fair assays.

ELKO COUNTY.

GRAND PRIZE MINING COMPANY.—This property, handicapped during the early part of the year by a heavy debt, is now out of debt, and report has it that this mine will yet make a showing equal to any in the Tuscarora group.

NORTH BELLE ISLE MINING COMPANY.—This property is now out of debt, and by the beginning of the new year will have $30,000 in the treasury, and will, it is anticipated, commence paying dividends.

WHITE PINE COUNTY.

OSCEOLA GRAVEL MINING COMPANY.—The annual meeting of the stockholders of this company was held on the 1st and 2d inst. The reports of the general manager and treasurer were presented. The following trustees were elected for the ensuing year: Charlton T. Lewis, Gustav E. Kissel, Geo. W. Maynard, of New York, and Benjamin Hampton and John Sharp, Jr., of Salt Lake City. At a meeting of the trustees the following officers were elected: Geo. W. Maynard, president; Charlton T. Lewis, vice-president; Gustav E. Kissel, treasurer, and Benjamin Hampton, general manager.

NEW MEXICO.

GRANT COUNTY.

AZTEC MINING COMPANY.—This company has failed to place its $75,000 in bonds which it decided to issue to meet a floating indebtedness of from $50,000 to $60,000. The directors have entered into negotiations with Mr. Nathan Frank of St. Louis, a bond and stockholder of the company, with a view of securing his aid in carrying the debt. At a meeting held recently they decided to call upon the stockholders to contribute 10 per cent. of their holdings as a bonus to be given to Mr. Frank. This bonus must be forthcoming on or before December 15th, but if sufficient stock is not contributed to give the necessary bonus, the stock will be returned to each individual stockholder.

SANTA RITA COPPER AND IRON COMPANY.—It is reported that the company's property has recently been examined by an expert. Negotiations for its sale have been pending for some time. J. P. Whitney of Boston, Mass., is principal owner; the price asked for the property is said to be $1,000,000.

NORTH CAROLINA.

MECKLENBURG COUNTY.

BALTIMORE & NORTH CAROLINA MINING COMPANY.—Mr. Thomas W. Hooper, of Baltimore secretary of the company, has been to the mine on a tour of inspection. It will be remembered that some time ago the ENGINEERING AND MINING JOURNAL noted that the mine had been closed; it has since been reopened, and will be developed by both sinking and driving.

HENDERSON GOLD MINING COMPANY.—Some time ago we noted that this mine had changed hands, and we can now state that the present manager, Mr. C. A. Rollins, is to remain in charge. The mill has been overhauled, and will soon be run. The ore body has been struck, and is being put in condition for mining.

OHIO.

HOCKING COAL AND IRON COMPANY.—President Adams of this company is quoted as having said: The company has in coal and iron, cash, bills receivable, accounts receivable and quick assets, about $800,000. Its indebtedness on November 7th, for bills payable was less than $70,000, wages, supplies and freights about $175,000, making a cash surplus in assets that could be realized on in 60 or 90 days of nearly $550,000.

PENNSYLVANIA.

COAL.

CHARLOTTE.—The fire is found to be still raging in these mines at Scottdale. After the smoke was driven from the mine it was discovered that the portion where the fire originated was still on fire. The opening was immediately closed and the pumps turned on in the hope of extinguishing it.

OIL.

A secret conference of oil producers of western and northern Pennsylvania was held at Pittsburg on the 10th inst. Prominent independent producers were present from Bradford, Warren, Oil City, Butler, Washington and this city. The object of the meeting is not known, but it is surmised that it was to form a producers' alliance to act in unison against the Standard Oil Company.

(From our Special Correspondent.)

Exports of refined, crude, and naphtha from the following ports, from January 1st to December 3d, were as follows:

	1890. Gals.	1889. Gals.
From Boston	2,432,490	4,339,613
Philadelphia	158,774,543	152,568,500
Baltimore	12,812,461	8,335,244
Perth Amboy	14,335,807	15,775,196
New York	433,804,252	416,229,185
Total	622,159,553	597,247,738

SOUTH CAROLINA.

CHESTERFIELD COUNTY.

BREWER GOLD MINING COMPANY.—At the meeting of the stockholders, to be held on January 18th, the question of concentrating the sulphurets and chlorinating them will be considered. When the ENGINEERING AND MINING JOURNAL'S correspondent visited the mine just after the new 40-stamp mill had been started in the spring, his attention was called to the considerable amount of sulphurets that appeared on the plates, though it was hardly perceptible in the ore without a careful scrutiny. It was then asserted that they would carry a large percentage of the assay value of the gold, which has since been confirmed by the mill runs of several months. Milling and amalgamation with plates extracts less than one-third of the gold in the ore, and now it becomes of vital importance that arrangements should be made at once to save and treat the sulphurets. The ore is low grade, and treating 2,000 tons per month will require the strictest economy and the most favorable working to make the mine pay. The cost of the plant would be nominal, and as to the cost of chlorination, it can be seen by reference to the article in Mining News of the ENGINEERING AND MINING JOURNAL of June 14th of this year, in which the cost of production at the Haile mine plant, operated by Mr. A. Thies, is given.

SOUTH DAKOTA.

LAWRENCE COUNTY.

BADGER.—This mine, in Hidden Treasure gulch, has been opened by the owners, Messrs. Bartolo & Son and J. S. Wilson. They have about 75 tons of ore on the dump, which is proved by late mill tests to be worth from $4.50 to $6 per ton. A 20-stamp mill (formerly known as the Jones Mill), located just north of the De Smet, has been purchased and put in running order.

(From our Special Correspondent.)

DEADWOOD, Dec. 5.

CLINTON MINING AND MILLING COMPANY.—This company, of Clinton, Ia., owns the Leopard group of mines which it is now working under the superintendence of Mr. Perry Aukeny. The property lies adjacent to the Portland and Trojan groups on Green Mountain, and extends over an area of 1,800 ×1,500 feet. In a shaft 50 feet deep three distinct bodies of ore divided by stratas of sandstone are exposed. Two of these bodies of dry ore have been cross-cut at a distance of 25 feet at the bottom of the shaft; the face of the cross cut at both ends showing ore. The upper body has an average thickness of four feet; the lower one pitches into the floor so that its thickness cannot be given. The ore body has also been drifted on for 60 feet. The north drift from the bottom of the shaft is about 25 feet to the face, where the ore show indications of running out with the dip of the formation. The south drift, about 35 feet long, is in ore the entire distance, the two bodies being very regular and persistent both in the walls of the drifts and at the southern face. The third ore body was passed through in sinking the shaft at a distance of about 35 feet from the surface. It was 2 feet thick. At other points on this property ore of the same character and about the same grade, yielding an average of $30 a ton, was encountered both in shafts and drifts. This fact leads the miners to believe that this blanket formation is continuous through the entire mountain. The theory that there are several contacts on this dry ore belt is more clearly demonstrated in this portion of the district than elsewhere. At Nevada Gulch the writer examined one point where ore was exposed in two tunnels on the side of the mountain, one about 200 feet higher than the other, and almost on a line with it; also in a shaft sunk 40 feet below the base of the mountain. Should it be proved that such is the formation in other sections of the dry ore belt, the value of the properties will be greatly enhanced thereby.

DOUBLE STANDARD MINING COMPANY.—The property of this company is located on Fantail Gulch, extending through the hill to Nevada Gulch, and consists of three locations. Joining it on the north is the Hardscrable mine. The main tunnel, 300 feet long, passes through a chute of ore, which is cross cut 150 feet by a drift. Beyond this chute a porphyry dyke was encountered for a long distance. At a point 300 feet from the entrance of the tunnel a winze has been sunk 16 feet to ore. A drift was then run about 90 feet, most of the distance in ore. Porphyry being again encountered, a second winze was sunk, reaching ore. On the north end of the property ore chutes which have been opened and worked indicate that the ore bodies extend through the hill separated by these dykes of porphyry.

HARDSCRABLE.—This mine owned by Malterney & Corr, joins the Double Standard on the north. It is within the lines of this property that the railroad graders opened up two bodies of ore. Cross cutting showed an average thickness of one to be eight feet. It assayed $30 a ton. A tunnel 90 feet long, of an average height of 14 feet, is in ore. At one point in the tunnel a hole was sunk six feet before quartzite was reached. As this ore body is about 45 feet above that exposed in the cut, accompanied by quartzite and underlaid by porphyry, it is thought, that they are separate contacts. The average yield of the tunnel ore was $47.71 a ton.

PIERCE.—This mine, located at Lead City, has been transferred to Thomas Bell, of San Francisco. It has lain idle for several years. It is to the north, and adjourning the Homestake property, and it is believed to carry a continuation of that property's veins, and will require deep working.

RAINBOW MINING COMPANY.—This company's property is located in Garden City District, six miles northwest of Deadwood. It consists of eight locations, and joins the Eva, Edna and Helen mines. In doing assessment work this year a body of dry ore five feet thick by 15 feet wide was exposed, showing an assay value of $24.80 a ton. An assessment of half a cent a share was levied to enable the company to continue work on this ore body. The stock is all owned by Deadwood parties. In the same district, on Black Tail Gulch, are the Carroll and Maloney properties, from which $50 ore has been regularly shipped to Omaha for some months past. In 1877 these discoveries of dry ore were first made, but little or no attention was paid to them. The formation is flat. The ore is overlaid by quartzite and capped by porphyry. In character the ore of this district is very similar to that found on the dry ore belt proper, which is about 4 miles to the west. In the territory between there has been but little prospecting except for free milling ore. The district is now receiving attention for dry ores.

TORNADO MINING COMPANY.—This company's property consists of seven claims, some of which lie parallel with the Double Standard; the remainder lie on the south side of Fantail Gulch adjacent to the Harmony and Hardscrable properties. The workings consist of 800 feet of tunnels, exposing long chutes of high grade ore cut by porphyry dykes. In three of the tunnels these ore chutes have an average thickness of six feet. On the north end of the locations the ore chutes are exposed in the workings, indicating a continuity and regularity, the character and grade being the same.

WELCOME MINING COMPANY.—This company's property is in Fantail Gulch, and joins the Double Standard on the west. Several years since the company spent $100,000 for a mill. It tried milling $20 ore by amalgamation. This proved a failure, and the mine and mill have remained idle until recently, when the superintendent, A. J. Malterney, was instructed to sink for another contact. This he has struck at a depth of 90 feet, the same level on which the ore body in the Double Standard was encountered, and 300 feet below where the upper contact was originally worked. The president of this company is expected here before January 1st, and it is expected work will then be pushed.

VIRGINIA.

STAFFORD COUNTY.

RAPPAHANNOCK MINING COMPANY.—This company's gold mine has stopped work and will remain idle for the present for want of money, though the property is said to have real value.

WASHINGTON.

OKANOGAN COUNTY.

(From an Occasional Correspondent.)

FIRST THOUGHT.—This mine is situated on the west slope of a high ridge, the west bank of the Salmon River, and above the town of Ruby. It is 90 miles from Wilbur on the Central Washington branch of the Northern Pacific Railway. The property consists of one full claim and a fractional claim of 903 feet on the vein, and sundry adjoining claims on each side of it for tunnel site purposes.

It is a true fissure vein of silver bearing quartz in a micaceous schistose slate. The line of fissure is, with the bedding of the schistose slate, bearing slightly to the west of north and east of south. The ore bearing portion of the vein is a hard, brittle, white quartz, massive in structure in the middle of the vein, but ribbony near the walls. At a point about midway between the endlines of the claim, the vein is horsed or split into three streaks toward the south, showing a different character of ore, while to the north it is one solid mass of quartz, but with the same distinctive characters of ore on the walls.

Previous to May, 1890, there had been spasmodic attempts to develop. In May of this year a systematic opening of the vein was begun. A tunnel is now in 410 feet. It is known as No. 1, is planned for the main working tunnel for that level, and is driven along the hanging wall, and from it, at every 50 and 100 feet, crosscuts have been driven to the foot wall. It is 5×7 feet in the clear, timbered solidly, and supplied with T rail track. At the intersection of the 250-foot crosscut with the foot wall an air shaft has been raised to the surface, 108 feet, and from that point south a drift has been driven along the foot wall parallel with the main tunnel for the double purpose of exploring the foot wall streak and to form a system of ventilation by means of the crosscuts to the main tunnel.

Tunnel No. 2 is a crosscut tunnel starting from a point 65 feet below No. 1, and 225 feet north of it. This cuts the foot-wall streak 60 feet in and the hanging wall at 114 feet, and gives backs on the slope of the vein of about 80 feet. From it drifts on the foot and hanging wall are being run southerly. It is intended that from this tunnel the ore bodies cut by No. 1 tunnel will be blocked out. Tunnel No. 3 is a crosscut from the bottom of the west side of the ridge and, by traversing about 700 feet easterly, will tap the vein about 320 feet below the level of tunnel No. 1. It is now in about 60 feet and progresses from three to four feet per day. It is proposed to run a crosscut tunnel west from the level of the Salmon River, through the hanging wall to the vein. It will be about 4,000 feet long, and will give total backs of about 2,000 feet, or 1,430 feet below the level of Tunnel No. 3. Altogether, there has been done to date in the past four months 1,150 feet of underground work, and before the first year is out a mile of workings will be completed.

The ore varies a good deal in its composition and physical characteristics according to its position in the vein. The bodies cut so far on the hanging wall are ribbony in structure, of white quartz, carrying coarse grained galena, iron and copper pyrites, with a little zinc blende, and when rich show considerable gray copper all through the mass of the other minerals. The ore in the central streak is composed of the same minerals, but finer grained and with less pyrites, while on the foot wall the ore is mostly fine grained galena, gray copper and zinc blende, sometimes occurring in masses of the pure sulphides, with little or no quartz associated. From the mouth of the main tunnel to the present face there has been ore continuously, so it may be assumed the chute now being opened is at least 400 feet long.

Located as it is upon a steep ridge, the mine will not require shafts, other than for ventilating purposes, until after the 2,000 foot level is reached. The Salmon River will provide about 200 inches of water in the driest seasons, and up to several thousand during the wet months. There is an abundance of timber in the neighborhood of the mine. It may be safely predicted, from the openings and assays made, that the mine will produce a fair quantity of shipping ore, assaying from 100 to 1,000 ounces, a large quantity of ore from 30 to 40 ounces, and that an immense amount of quartz, carrying 10 to 15 ounces, can be extracted. If this low grade ore can be concentrated profitably, as there is every reason to believe it can be by the improved modern methods, the mine has a great future.

WEST VIRGINIA.

A Thursday's dispatch from Fairmont conveys the information that 2,000 miners are out at the Monongahela mines. The strike is said to be against a reduction of five cents per ton. The mines are controlled by a syndicate in which ex-Senator Camden, Governor Fleming and Senator Gorman, of Maryland, are largely interested.

CULPEPPER COUNTY.

(From our Special Correspondent.)

ELLIS.—This Ellis, owned by Mr. Johnson, is working and has a few thousand tons of quartz on the dump that is said to sample well. The property contains about 7,000 acres, mostly timber lands, but with several quartz veins.

OIL.

The Supreme Court of West Virginia recently, reversing the decision of the lower courts, handed down two decisions in favor of E. M. Hukill, of Pittsburg, an oil operator in the Mt. Morris field. They involve the oil rights to the W. P. Core farm and the A. M. Fox farm, the value of which is about $200,000. Both cases were based on an alleged forfeiture of the leases by Mr. Hukill. The production of the Mt. Morris field is said to be about 1,100 barrels a day.

WYOMING.

(From our Special Correspondent.)

LARAMIE, WYO., Dec. 4, 1890.

The State mining convention will be in session at Cheyenne December 30th and 31st and January 1st and 2d.

Wyoming's output of coal will exceed 1,500,000 tons this year. Coal mines are now operated along all the railroads in the State. It is now claimed that the Kilpatrick mine at Newcastle is producing a very good coking coal. Coke ovens are being erected, and in a short time the product will be placed on the market. If the coke will stand the burden of a furnace, it means much for the many low grade mining camps in the Black Hills, which have an abundance of refractory ore that will mill $35 per ton.

It is currently reported that two flowing petroleum wells have been struck at Caspere. The oil sent abroad as samples is a very light oil with a rich greenish hue and contains a high percentage of kerosene. If this is true Wyoming has four flowing wells of petroleum. The other two, being east of Lander, were drilled several years ago and plugged. They will flow about 200 gallons each in 24 hours.

ALBANY COUNTY.

The Laramie people have subscribed money enough to build a wagon road over the range to Brush creek. This will greatly facilitate travel to that point, it being over 100 miles nearer than by the way of Rawlins. The veins in this new camp are looking extremely well and hold their values at 20 feet in depth.

Certain parties are about to develop the Laramie Peek asbestos properties. There was some prospecting done on these claims two years ago. Asbestos of various grades was found in large quantities.

Mr. McMullin is busily engaged in developing his Bismuth property. The ore found on the property is very remarkable for its richness and purity. Assays often run as high as 80% metallic bismuth. The ore is a carbonate of bismuth carrying minute particles of the pure metal. Thus far the vein has not been found. The ore occurs in irregular masses, ranging from a few ounces to several hundred pounds.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

(From our Special Correspondent.)

NELSON, Nov. 24.

Prospecting and surface mining are at an end for the season, the mountains being covered with a few inches of snow.

Work on the railroad from Sproat to Nelson is being actively prosecuted and the same will be available for traffic early next spring.

A committee of mining men has been summoned to sit at Victoria for the purpose of revising the mining code of the province. Reform is sadly needed, for the government authorities themselves are at variance as to the meaning of a number of the sections.

The case of the "Toughnut" *vs.* the "Evening" claims—an overlap contest—was, by the consent of both parties, heard at Nelson before Judge Spinks on the 13th inst. A decision was not given on all the points involved, but the verdict generally was in favor of the Evening claim. The survey of the Evening showed that the three stakes were not in line, and Judge Spinks gave it as his decision that the owners of the Evening—it being the prior location—had the right to run their center line straight from end stake to end stake or straight from No. 1 stake to No. 2 (center) stake and then to continue this line to the end of the claim.

HOT SPRINGS DISTRICT.

GOAT RIVER.—Encouraging reports reach us from this new district. The tunnel on the Alice claim is in 60 feet and when run 100 feet further will tap the ledge at a depth of 105 feet. As shown by open cuts the ledge is 2 to 3 feet wide, assaying 40 ounces and upward in silver and 40 to 50% lead. The other claims have had assessment work done on them. A mining recorder will be appointed for the camp in the spring.

LITTLE DONALD.—Work has been discontinued on this claim, owing to a cave in the shaft. J. C. Davenport has sold his one-half interest in the claim and also in the Black Diamond, the north extension of the Little Donald, to his partner, T. M. Munn, of the Northern Pacific Railway, for $10,000. Development by a new shaft is promised in the spring.

SKYLINE AND KRAO.—The machinery for these mines is being placed in position. Some 1,200 sacks of first class ore are being shipped from the Skyline to Montana smelters. A very large quantity of lower-grade ore is on the dump. It will not bear present transportation charges. The 130-foot incline shaft has been temporarily abandoned, there being 50 feet of water at the bottom.

UNITED AND NUMBER ONE.—These properties will be worked through the winter. The government wagon road has been extended from the Krao to the United, the shaft house on the latter claim is completed, and the pump and hoist are being placed in position. Owing to the northerly and southerly strike of the veins, the water level in the Hot Springs Camp is reached about 50 feet from surface. A station has been put in on the United at the 50-foot level, and a drift is being run in each direction. Recently the ledge has been traced nearly the full length of the claim. On the Number One the upraise from the tunnel is rapidly approaching the bottom of the incline shaft.

WASHINGTON REFINING AND SMELTING COMPANY.—The experimental smelter, after the Best patent, erected at Hot Springs by this company, had but a short career. In making its first trial run the smelter split in two, owing, so the patentee, C. J. Best, asserts, to insecure foundation.

NELSON DISTRICT.

FORTY-NINE CREEK.—The Hydraulic Company has suspended operations for the year. The clean-up produced about $3,000, a little more than enough to pay for the plant and wages. Operations will be resumed in the spring.

KOOTANIE-BONANZA MINING COMPANY.—The parties who "jumped" two of the locations of this company last fall, and who attempted to prove their claims to the same in the Victoria law courts, have abandoned all claim to the property. Active work should now be *en route*. The tunnel on the Silver King is in over 300 feet, more than half the distance to the bottom of the 160-foot winze.

POORMAN.—Both the mine and mill have been shut down for the winter; reason assigned, want of water power in Eagle Creek. Only two men are now on the ground and they are employed in running the lower tunnel, which is to tap the ledge about 325 feet below the outcrop.

ROVER CREEK.—Several of the claims in this section are looking well. The 2,800-pound sample from the Whitewater claim sent to the Revelstoke smelter gave returns of $110 per ton in gold and 9 ounces in silver. Recent samples from the Snowwater, the Eastern extension of the Whitewater claim, gave returns as follows: Free milling ore, gold, $108; silver, 13·4 ounces. sulphurets, gold, $156; silver, 49·2 ounces, per ton.

ROYAL CANADIAN.—A Mr. John Johnston, said to represent Australian capitalists, had a look at this gold property recently, and offered the owners $15,000 for a one half interest, provided a ton of the ore now on the dump be treated, and that it assay $20 per ton. The agreement also called for the erection of a plant to cost not less than $15,000.

SALMON RIVER.—Reputed good placer ground has been discovered near the head-waters of this river, about 12 miles from Nelson. Local parties have formed five companies and no less than 4,300 feet of ground has been located. There will probably be a rush there in the spring, but there is, as yet, no reason for supposing that the pay ground is so extensive as the number of locations would lead one to imagine.

TOUGHNUT.—The owners have decided to run a cross-cut at the bottom of the 75-foot shaft, it being their opinion that the shaft was not sunk on the ledge proper.

WILD CAT.—The bond of a one-half interest in this claim has been taken up and work will be carried on through the winter. The tunnel is now in 120 feet and a drift is being run easterly on the hanging-wall. A vertical shaft will be sunk as soon as frost sets in—there being considerable surface water—and will be continued downward until the foot-wall is reached. Geo. E. R. Ellis, M. E. of Nelson, has the management of the property.

TRAIL CREEK DISTRICT.

This new camp is exciting considerable interest in the mining centers of Washington. Three claims on "Red Mountain"—the St. Elmo, Spar, and Mountain View—have been sold to Portland parties for $12,000. The Le Roi claim has been divided into 30 shares of the value of $1,000 each; 16 of these have been taken under a working bond by Spokane Falls and other parties, the owner retaining the other 14. Active work will be continued on a number of the claims through the winter.

CANADA.

PROVINCE OF NEW BRUNSWICK.

The St. John *Telegraph* states that the iron pyrites deposits located near St. Stephen have been assayed and are said to contain from 2% to 2½% of nickel. The composition of the ore is said to be the same as is found in the Sudbury district, with the exception of a smaller per cent. of nickel,

PROVINCE OF QUEBEC.

BADGER SILVER MINING COMPANY.—It is understood that a St. Louis stockholder of this company has received advices to the effect that negotiations for the purchase of the property are being made with an English syndicate, in which an offer of $600,000 was made for the mine, two-thirds to be paid in cash and one-third in stock of the new company. This is on a basis of $12 per share for the capital stock of the company, which is capitalized for only 50,000 shares. The consummation of this deal, it is said, will depend upon the stockholders before whom the proposition will be laid. English experts are said to have already made an examination of the property, and it was on their report that the deal, contemplated some time ago was reopened.

(From an Occasional Correspondent.)

BLACK LAKE, Dec. 4.

SCOTTISH CANADIAN ASBESTOS COMPANY.—This company purchased its property in 1886. Mr. E. C. Bacon was appointed manager and Capt. Matthew Penhale superintendent. The first important work was an opening made, cutting the face of the property, and the sinking of the main pit to prove the ground. Next the mine was equipped with steam hoist, compressor plant, tramways and dressing mill. This plant is in a building 40 × 80 feet, three stories high. The ore is handled by pickers, sorters, rock breakers, rolls, screens and blowers. The machinery is worked by steam power. The mine has been idle for two years, owing to litigation. The company is only awaiting the favorable decision of the courts to resume operations.

DUTCH EAST INDIES.

SINGKEP TIN COMPANY.—The shareholders of this company have had their first ordinary meeting at Amsterdam. The report of the Board of Directors states that the works at Singkep—which is a small island in the Riow group, noted for its tin deposits—have only been of an exploratory character. Serious mining work has just been started, with prospects stated to be very good, and a steamer has been purchased to transport the ore to Singapore as soon as it is produced in sufficient quantities. The shareholders authorized the Board to open negotiations with the Sultan of Lingga, to whom Singkep nominally belongs, under Dutch suzerainty, in order to obtain a modification and a prolongation of the concession for working these tin mines, which have yielded good tin in former times.

EAST INDIES.

MINING PROSPECT IN CHOTA NAGPUR.

An economic survey is now being made of the Jharia coal fields, Chota Nagpur, and leases have been granted for mica prospecting, under rules lately framed by the government. In the mica mines the output was 1,333 maunds; in refined copper 320 tons. In regard to gold it is said that in Lohardugga the aborigines of Sonapet have for a long time obtained small quantities of gold by washing the sands of the Sona River, but the quantities gathered have never paid them more than their daily wages. The Sonapet Valley is almost entirely encircled by a belt of hills, in which some of the reefs have been examined by mining geologists, and the favorable reports submitted have encouraged several persons to take up tracts of land with the view of forming mining companies. The Bengal-Nagpur Railway has brought the district of Singbhoom within reach of Calcutta and into prominent notice in commercial circles.

MEXICO.

Messrs. August Beckert, A. J. Beckert, C. L Straub, Walter Morris, Carl Seibert, Matt Weiss, Fred Bentz, S. A. Johnson, Marshall Johnson, Charles Weaver, of Moundsville, W. Va.; L. H. Denling, of Baltimore; R. E. Russel, of San Francisco; Wm. Russel, of Texas; Richard Daly, of Presidio, and Juan Zubrion, of Mexico, are said to be interested in three newly discovered coal deposits in Mexico, near Ojinago, two of which are bituminous and one anthracite. The tract aggregates 20,000 acres. Diamond drills have been set at work upon the property, and a company will be organized for working the deposits.

GUANAJUATO.

BOLAÑITOS.—This mine, situated at La Luz, has now, it is said, an average weekly output of ore of about 1,500 cargas (a carga is 300 pounds), giving from 15 to 16 marcs of silver with some gold. The difficulties recently encountered by the owners are due to their having pushed development work beyond the legal limits of their property. The pending litigation against the owners of Bolaños has, according to rumors, been decided adversely to them by the Guanajuato State tribunals. The property gives employment to a large number of hands, which are paid from $1.12 to $1 25 per diem. Nearly all the 12,000 inhabitants of La Luz are dependent on this and the Melladito mine, another important property.

RUSSIA.

It is announced that large silver mines have recently been found at the Kouban sources. More than twenty deposits of silver and lead have been discovered, some of which have been worked in olden times, but in a most primitive fashion. The ore has been analyzed, and proves to contain a large proportion of metal. Deposits of coal have also been found in the neighborhood.

DIVIDENDS.

Aspen Mining and Smelting Company, dividend No. 19, of 10 cents per share, $20,000, payable December 15th at the office of the company, No. 54 Wall street, New York City. Tranfser books close December 12th and reopen December 17th.

May-Mazeppa Consolidated Mining and Milling Company, dividend No. 7, of one per cent. per share, $10,000, payable December 15th, at the office of the company, Room 7, Patterson & Thomas Block, Denver, Colo.

MEETINGS.

Andes Silver Mining Company, at Rooms 2 and 3, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., December 18th, at 12 o'clock noon.

Gould & Curry Silver Mining Company, at Room 69, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., December 15th, at 1 P. M.

Kentucky Mining Company, at No. 310 Pine street, San Francisco, Cal., on December 17th, at 1 P. M.

Mount Diablo Mill and Mining Company, at No. 318 Pine street, San Francisco, Cal., December 15th, at 1 P. M.

Ontario Silver Mining Company, at No. 309 Montgomery street, San Francisco, Cal., December 20th, at 12 o'clock noon.

Potosi Consolidated Mining and Milling, at No. 1119 Sixteenth street, Denver, Colo., December 31st, at 10 A. M.

ASSESSMENTS

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Atlantic Con., Nev.	..	Nov. 11	Dec. 29	Jan. 19	.25
Big Camas, Idaho..	5	Oct. 15	Nov. 17	Dec. 17	.05
Confidence, Nev	17	Nov. 17	Dec. 22	Jan. 12	.75
Con. New York, Nev.	4	Nov. 12	Dec. 17	Jan. 6	15
Crown Point, Nev.	53	Dec. 3	Jan. 7	Jan. 28	.50
Live Oak D., Cal....	12	Sept. 3	Dec. 10	Jan 5	.05
Martin White.....	24	Oct. 17	Nov. 24	Dec. 16	.25
Morgan, Cal.....	14	Oct. 30	Dec. 6	Dec. 29	.10
Prior Hill, S. Dak..	1	Oct. 27	Nov. 29	Dec. 15	.004
Seabury-Calkins, S. Dak.....	13	Oct. 27	Nov. 29	Dec. 20	.01
Washoe, Nev.....	1	Oct. 28	Nov. 28	Dec. 27	.05

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 707 and 708.

NEW YORK, Friday Evening, Dec. 12.

The week under review has not shown any marked improvement. Some mining shares have undergone a sharp decline, but there is no notable advance in one stock. Considering the stringency in the money market, mining stocks have not done ill. A cheering feature of what little trading there has been is the fact that a great many of the stocks have been bought as a permanent investment.

The special feature of the week has been the trading in Middle Bar, which opened at 40c. and declined to 5c. The broker who has been doing most of the selling informed a representative of the ENGINEERING AND MINING JOURNAL that a deal was on the *tapis*. He said he had been instructed to sell the stock down to about 5c. and to keep it there, in order to enable certain parties to buy all the stock that is held by outsiders. Just how much truth there is to this report is difficult to determine. The majority of the people on the exchange seem to know nothing whatever about the said deal. During the week 25,800 shares changed hands.

There is a solitary sale of 100 shares of Bodie Consolidated at 95c., and another of Standard at $1.

Plymouth has one sale of 300 shares at $2.25.

We note one sale of Quicksilver common at $5.50.

Astoria declined during the week, selling at the close at as low as 3c. Sales of this stock aggregated 10,800 shares. Of Sutter Creek sales of 1,400 shares at $1 are reported.

Brunswick Consolidated was dealt in to the extent of 10,000 shares at 11c @15c., which is considerably lower than last week, when the stock sold as high as 19c. The officers of the company continue to receive encouraging letters from the superintendent of the mine, but somehow or other people don't seem to put much faith in them.

Of the copper stocks there is one sale of Atlantic at $16.25, and another of Franklin at $18.18. Kearsarge was quiet at $11.25. Tamarack shows one transaction of 20 shares at $157.50. Huron was in some request at $3.63@$3.88.

Ontario was traded in to the extent of 310 shares at $40@$41.50. Stormont was neglected at 5c.@6c. There were no sale of Horn Silver during the week. The company has declared the usual dividend of 12½c. payable on the 24th inst. The books close on the 16th inst. The superintendent writes: "There is nothing new in the development work. The mine looks splendid."

Of the Colorado stocks we note one sale of Adams at $1.50. It is reported that there is enough ore in sight at the mine to insure the payment of a dividend in January. This report could not be verified. Freeland advanced from 25 cents to 30 cents with sales of 6,700 shares. Leadville Consolidated was quiet at 12 cents and 13 cents. Of Little Chief 2,200 shares at 30 cents to 33 cents changed hands. This company has declared a dividend. There is one sale of Silver Cord at 25 cents, and another of Lacrosse at 6 cents.

Of the Comstocks, Consolidated California and Virginia was sold at $3.10; Crown Point at $1.50@$1.60; Gould & Curry at $1.55@$1.60; Ophir at $3.50@$3.65; Savage at $1.85; Sierra Nevada at $1.90@$1.95; Yellow Jacket at $2.15; Alta at 90c.@$1; Bullion at $1.90 and Chollar at $2.50@$3. Comstock Tunnel was traded in at 15c., the bonds at 29c., and the scrip at 29c. Exchequer has one sale at 85c. Julia appeared in moderate request at 37c.@38c., and Mexican at $2.60@2.65. Potosi was quiet at $4.40@$4.75 and Scorpion at 30c. Utah shows sales of 1,100 shares at 65c.@80c., the former being the closing price.

We note sales of the Black Hill stocks. Caledonia was traded in at 80@82c. Late reports from this property are to the effect that the mine has been shut down, and that Superintendent Skinner has gone to California for the winter. There is one sale of Homestake at $8.88, and another of Deadwood Terra at $1.40.

Mutual Smelting and Mining Company was sold at $1.40@$1 50. Shoshone shows one sale at 2c.

El Cristo was quiet at 65@70c.

Phœnix of Arizona declined during the week to 45c., but rallied at the close, and was sold at 75c., the highest price of the week.

Holyoke was neglected at 4c.

Boston. Dec. 11.

(From our Special Correspondent.)

There have been all sorts of rumors current the past week in regard to the copper stocks, evidently for the purpose of depressing the market. It is said that the large companies failing to market their holdings of ingot are seriously considering the expediency of reducing the price to 16c., and this is given as a reason why the Calumet & Hecla has not declared the dividend usual at this season. These reports, in connection with the tight money market, have forced stocks carried on margins upon the market, and there has been considerable liquidation, carrying prices down to a lower level than at any time during the past six months.

The high priced stocks have suffered most, notably Calumet & Hecla and Tamarack, the former selling at $244, a decline of $24 for the week, and the latter to $123, a decline of $32. Of course, the whole list has felt the depressing influence of the decline in these two stocks, and has sympathized with them to a greater or less extent.

Allouez declined from $4½ to $3½, but recovered to $4. A report was current that the cross cut in the exploring pit had been stopped, but the report is denied on the best authority.

Atlantic has been quite steady at $16 to $15¼.

Boston and Montana declined to $40½, rallied to $42⅝; but settled off again to $41.

Butte declined from $15 to $12½, recovering to $13.

Centennial was off to 12¼ to-day, but the rumor (which the mine officers refused to confirm) that the Tamarack Jr. had struck the Calumet lode, which was currently reported on the street to day, cause" an advance to 14½. Kearsarge was raided by a prominent operator on the bear side of the market which resulted in a decline to $9. The reports from the Tamarack above noted, caused some covering, and the price advanced to $10¼.

Franklin declined from $18 to $15, with recovery to $16.

Osceola shared in the general decline, and touched $30⅝ as the lowest point for the week. To-day it sold at $31½@$32.

Quincy sold down to $81, recovered to $90, closing at $85.

Santa Fé declined to 37½c.

Huron sold at $3½, and National at $2. Reports from these two mines are of a favorable character.

Silver stocks are without any special feature. Dunkin sold at 65c. The report of the company just issued shows a cash balance in the treasury of $35,639.16. Catalpa declined to 25c.

3 P. M. Calumet sold this afternoon at $240. Tamarack advanced to $130. Osceola to $32. Kearsarge steady at $10½. Atlantic declined to $15. While Butte & Boston advanced to $13¾.

The stock of Tamarack, Jr., which was offered early in the week at $28 is now in request at $45.

By telegraph.—Calumet $244, Tamarack $138, Quincy $90, Boston & Montana $42, Osceola $32¾, Atlantic $15¼, Centennial $15, Kearsarge $10, Allouez $3¾.

Denver. Dec. 8.

(From our Special Correspondent.)

Business improved in many ways during past week. Brokers receiving more orders than usual for the dividend payers] and quite a number for the most promising of the others. Taking into consideration the blockade of ores on the railroads, the extra output, the rise and fall of silver and lead, the losses of ore buyers, smelters and producers, the outlook on the exchange is very encouraging. To-morrow they will remove to new quarters on Curtis street, in the heart of business, and probably a decided improvement in volume of

business and prices will result therefrom. The monthly reports of the listed properties are improving in many ways and has considerable to do with the increase of business.

The foundation work on the new Exchange Building is progressing favorably, the continued fine weather enabling the contractors to work without interruption.

Considerable uneasiness is shown by both shippers and handlers of ores as to the outcome of the Silver bill in the present Congress, and its uncertain progress is depressing and demoralizing to every camp in the State.

Prices and sales for the week ending Dec. 6th.

Company.	Opening.	H.	L.	Closing.	S.
Alleghany, Colo	13¼	13¾b	12¾b	13	.....
Amity, Colo	05b	*05	05	01½	300
Bangkok, C. B., Colo	06¾	06¾	06¼	06¼	2,600
Bates-Hunter, Colo	38b	47b	38	47	2,900
Brownlow, Colo	05½b	06b	05½b	05¾	.....
Calliope, Colo	16b	18¼	18	18	1,400
Cash, Colo	10b	10½	10¼	10½	100
Clay County, Colo	92b	*100	92	94	3,500
Hard Money, Colo	....	02¾b	02b	02½	.....
Leavenworth	67b	70	70	70	100
Little Rule, Colo	90b	93	92	93	7,300
Matchless, Colo	200b	200b	103b	200	.....
May-Mazeppa, Colo	109b	115	104	115	3,800
Mollie Gibson, Colo	....	....	....	....	.....
Oro, Colo	....	103	100	100	200
Pay Rock, Colo	01½b	01¾	01¾	01¼	1,000
Puzzler, Colo	07½b	07¼	07	05¾	1,100
Reed-National, Colo	70	70	70	70	500
Running Lode	21b	22	20½	20¾	2,100
Silver Cord, Colo	40a	30b	30b	....	.....
Whale, Colo	16b	16¼b	13	13	900
Prospects.					
Argonaut, Colo	17b	17¼b	14b	14	.....
Aspen United, Colo	01¼b	05½	01¼	05½	4,400
Big Indian, Colo	10b	11½	11	10½	500
Big Six, Colo	06¼b	06½	06¼	06	2,300
Century, Colo	35a	35	35		700
Claudia J. Colo	06¼b	06½	06	06	2,350
Nat. G. & Oil Co	21	†25	20	20	9,400
Diamond B., Colo	02¾	02¾	02½	02½	7,300
Emmons, Colo	36b	†40	35	35	2,800
Golden Treasure, Colo	17¼b	20	18½	20	2,400
Ironclad, Colo	05½b	05½	04¾	04½	3,700
John Jay, Colo	06b	10	09	08½	1,300
Justice	15	1a	15	14½	100
Legal Tender, Colo	04b	04	04	04	100
Morning Glim, Colo	45b	50	47	50	1,000
Park Consolidated	33¼	33¼	30	30¼	1,600
Potosi, Colo	05¼b	05¾	05½	05¼	2,500
Rialto, Colo	60a	50b	39b	....	.....
Total for the week					71,550

*Buyer 30 days. †Buyer 60 days. ‡Seller 60 days. Seller 30 days. a Asked. b Bid.

Kansas City.

Highest and lowest prices and sales for the week ending Dec. 9.

Company.	H.	L.	Sales.
Argonaut	14½	14	200
Bates-Hunter	41	41	14,500
Big Six	8½	6¾	30,000
Cash Gold	16	15	3,500
Clay County	97	92	1,400
Diamond B	2	1¾	1,000
Hard Money	6	4	2,300
Hunki Dori	8	....	100
Iron Clad	6	....	200
Kansas City, Col	2.75	2.70	280
Leavenworth	77	..	63,200
Little Nugget	95	92	6,400
Little Rule	1.00	93	3,000
May Mazeppa	1.17	1.10	1,400
Minnequa Zinc M. Co.	5	....	100
Monte Cristo	3	1½	200
Morning Glim	45	41	20,300
Pay Rock	....	....	.....
Pelican	....	....	.....
Potosi	....	....	.....
Running Lode	6½	6	1,900
Sylph	24½	20	17,200
Total			166,980

San Francisco. Nov. 6.

(From our Special Correspondent.)

The steady tone which prevailed in the stock market and which encouraged the thought that better times were close at hand gave place, during the early part of the current week, to a bearish onslaught which has thrown the market into a demoralized condition. Margin holders are being crowded out and business is meanwhile reduced to a minimum. Throughout the year the market has steadily been tending downward, and, while the present depression has for its cause nothing more substantial than the wire pullings of stock manipulators, the operation of "loading up the public" is shown in the following supposititious deal:

If an investor had purchased 100 shares of each Comstock property on, say, May 14th, and held them until the 18th of November, he would have found that his stock had depreciated meantime just 41%. During the same period of time there was levied on these stocks no less a sum than $855,000. While a certain proportion of this sum went in paying expenses of working the mines, the balance—and much the larger proportion—would, it is alleged, be divided between the brokers and the manipulators. A short time ago Bodie was reported to be on the eve of better times; a strike had been made and the mill was to be started up. The stock was sent up to $3@$3.10, and the mill crushed some $15,000 worth of rock, and then came the end. The public holds Bodie now selling at 90 cents and the mill is running on tailing and will soon close down. Potosi, Bullion and Chollar have all been crushed down to very low figures, albeit the outlook in the mines continues to be good with encouraging prospects.

Lake Superior Iron and Gold Stocks.

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co	$25.00	$60.00	$66.00
Aurora Iron Co	25 00	8.50	9.50
Champion Iron Co	25 00	101 00	102.00
Chandler Iron Co	25.00	40.00	42.00
Chicago & Minn. Ore Co	100.00	115.00	118 00
Cleveland Iron Co	25.00	17.00	18.00
Germania	25.00	11.50	12.00
Jackson Iron Co	25 00	110.00	125.00
Lake Superior Iron Co	25.00	70.00	75.00
Milwaukee Iron Co	25.00	5.50	6.50
Minnesota Iron Co	100.00	83.00	87.50
Montreal Iron Co	25.00	9.50	10.00
Norrie (Metropolitan)	25.00	75.00	78.00
Odanah Iron Co	25.00	17.00	18.00
Pittsburg Lake Angeline Co.	25.00	175.00	200.00
Republic Iron Co	25.00	39.50	41.00

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Mg. Co	....	....	....
Grayling Gold & Silver Co	$25.00*	....	..
Michigan Gold Co	25.00*	....	....
Peninsula Gold & Silver Co	25.00*	....	
Ropes Gold & Silver Co	25.00	$2.00	$2.25

Quotations nominal.

PIPE LINE CERTIFICATES.

(Specially reported by Messrs. WATSON & GIBSON.)

Early in the week the market for national transit certificates was very weak, due chiefly to selling from Pittsburg, where it is understood loans were called, and where an uneasy feeling existed as to the financial situation. Later there was a recovery, accompanied by dullness. The Ohio oil market continues neglected at nearly nominal quotations of about 15 cents. The outlook for the petroleum market is of continued stagnation and, we think, of gradually falling price for the Pennsylvania article, which relative to Ohio is too dear.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Dec. 6	....	....	....	....	.....
8	....	....	....	....	.....
9	....	....	....	....	.....
10	....	....	....	....	.....
11	64	64	64	64	2,000
12	64¼	64¼	64⅛	64¼	13,000
Total sales in barrels					15,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Dec. 6	65	65	64⅞	64⅞	28,000
8	64¼	64⅝	61⅛	61⅞	162,000
9	62⅜	64¼	62⅜	64¼	47,000
10	65	65⅜	64⅝	64⅞	36,000
11	64¾	65¼	64⅜	65	16,000
12	65	65⅛	64¾	64¾	24,000
Total sales in barrels					313,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, December 12.

Statistics.

STATEMENT of shipments of anthracite coal (approximated) for the week ending December 6th, 1890, compared with same period last year:

Regions.	Dec. 6, 1890.	Dec. 7, 1889.	Difference.	
Wyoming Region. Tons	374,365	334,632	Inc.	39,733
Lehigh Region "	108,914	128,859	Dec.	19,945
Schuylkill Region "	204,075	203,185	Inc.	890
Total Tons	687,354	666,676	Inc.	20,678
Total for year to date Tons	33,497,423	33,338,652	"	158,771

PRODUCTION OF BITUMINOUS COAL for week ending November 29th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1890. Week.	1890. Year.	1889. Year.
Phila. & Erie R.R.	2.217	125,518	81,435
Cumberland, Md.	†85,616	3,522,228	2,885,265
Barclay, Pa.	*2,861	143,719	116,292
Broad Top, Pa.	11,356	479,935	339,087
Clearfield, Pa.	7?,725	3,479,162	686,279
Allegheny, Pa.	22,160	1,173,578	765,130
Beach Creek, Pa.	48,362	1,726,180	1,437,252
Pocahontas Flat Top	34,792	1,754,960	1,607,176
Kanawha, W. Va.	*46,245	1,922,362	1,716,798
Total	326,334	14,327,642	9,634,714

* Estimated
† Week ending Nov. 29th.

WESTERN SHIPMENTS.

Pittsburg, Pa.	19,448	781,586	633,863
Westmoreland, Pa	21,521	1,078,613	1,450,431
Monongahela, Pa.	14,254	511,429	353,356
Total	55,223	2,371,628	2,437,650
Grand Total	381,557	16,699,270	12,072,564

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending December 6th, and year from January 1st, in tons of 2,000 lbs.: Week, 105,340 tons; year, 4,988,977 tons; to corresponding date in 1889, 4,211,211.

Anthracite.

As business in hard coal continues just as dull as it has been for some weeks, the associated wisdom of the sales agents exercises itself in self-congratulation that things are no worse than they are, and that there is every prospect of an improvement. They met again on Thursday, and again "canvassed the situation," with that result. Now that the output is settled for December, and December prices have been decided upon (and coal sells at the September scale), these continual meetings would seem to be held for some occult purpose, unless it be to inquire who, if any one is underselling his neighbor. The fact that it is positively stated that no one accused any one else at this last meeting would give color to the supposition that there may be some ground for accusation. Certainly, vigilance in this regard is needed in the present state of the market. Another meeting is to be held on December 30th, to further canvass the situation, and to legislate for the year of grace, 1891, and, mayhap, to invoke a good cold winter.

The volume of stocks has reached that stage when it is found necessary in self-defence to stop overproduction and to live strictly up to the agreement. With this object the Delaware, Lackawanna & Western Company has shut down its Wilkesbarre division for a time, and it is expected that one or two others may follow suit. Therefore, there is every reason to believe that the tonnage for the month as agreed upon will not be much exceeded.

It is very certain that the fleeting snaps of cold have had very little effect on the retail stocks, for the retailer has not been in the market during the week, nor, for that matter, has any one else excepting buyers of small lots for immediate consumption. Even small lots can be secured at a split between September and December prices. There is scarcely any pretense of selling coal at the latter figures. Pea and buckwheat continue scarce and strong, with stove the only one of the other sizes moving to any extent.

December prices are: Stove, $4.40; egg, $4.10; broken, $3.75; chestnut, $3.95. Buckwheat and pea are rather weak, as follows: Buckwheat, Lehigh, $1.60; free-burning, $1.60@$1.75 on board; pea, $2.25; free-burning, $2.40@$2.50. Of these, however, the quotations for pea and buckwheat are the only ones which obtain.

Bituminous.

The supply of soft coal to this market is growing worse and worse, with little prospect of relief to be of immediate service. Vessels are going out of commission and into winter quarters, and accident has still further limited the inadequate supply of cars. A recent accident on the Pennsylvania Railroad has for the time being stopped freight carrying. Coal companies suffer the mortification of seeing their coal stacked up as high as the telegraph poles while everything is sacrificed to get passengers through. To make matters worse, coal cars to Philadelphia are also scarce, and several companies are paying demurrage to vessel owners in consequence.

This concatenation of circumstances has had two effects—an increase all round of ten cents per ton and the inauguration of a movement to shut down on new business until March next.

The Seaboard Coal Association met last week, about a third of the members being present. They adopted a wise course in their endeavor to induce the whole soft coal trade to join them in resolving to submit to all operators the question of an agreement to take no orders for new business until March next. There is, however, little probabilty of any unanimous agreement to that effect, though it is admitted that course would greatly relieve the market. "But in the light of former experiences," said the representative of one company, "it looks too much as if one or two concerns wanted to control the market. If all would stick to such an agreement it would be beneficial, but the fear that some would break away will deter others from joining the movement."

Demand has been fairly active during the week, but the poor supply results in fancy prices being asked. Soft coal is actually selling at the following prices to-day: At Baltimore, $2.60 f. o. b.; at Philadelphia, $2.65; at New York, $3.25; alongside, $3.45.

Boston. Dec. 11.

The anthracite coal situation has not changed a particle since our last report. Trade continues dull and the insignificant amount of new business is not considered a factor in the market. Nearly everybody appears to have all the coal he wants, at least for the present. One dealer was heard to remark that he carried over enough coal from last winter to meet the business of the present season. A fair amount of coal is being moved on old contracts, and to attend to this is about all the agents have to do. The prices are weak and concessions are offered on every hand at the appearance of a fair-sized order.

Bituminous coal continues extremely scarce at this point. The demand is good, and spot lots sell readily at an advance. Agents are all activity, and keep skirmishing around endeavoring to keep up with the demands of old contracts. The conditions of gas coal are unchanged and the supply is as tight as ever.

Freights are holding firm, considering the uncertainty of getting cargoes. From New York 85@90c. is quoted, from Philadelphia, $1.10@$1.20, and from Baltimore, $1.15.

The retail demand was improved greatly by the cold weather. Buying was resumed quickly, and to such an extent that a conference of dealers was held with the hope of advancing prices. In this they failed, however. Mild weather again prevails and the demand is not so brisk. Prices continue strong.

Matters at Mystic Wharf are worse than ever, and several concerns will have enormous demurrage to pay. The coal is tied up at this point, and many of the mill centers are clamoring for a supply.

The Boston & Maine Railroad have recently leased a few acres of water front at the mouth of the Mystic River to the Reading Company for an annual rental of $20,000. The Reading people are building large docks and sheds here and will establish a coal distributing point. The place affords a grand opportunity for the Reading Company to conduct its coal business, provided it canget the assistance of the Boston & Maine Railroad in forwarding its coal to interior points.

Buffalo. Dec. 11.

(From our Special Correspondent.)

The temperature for several days has been of such a character as to cause a good demand to be made upon coal bins, and as a consequence trade in anthracite was quite lively. Prices unchanged.

Bituminous coal in request and large sales for city and nearby points were made at about the quotations given in circulars. The demand for vessels has, of course, ceased; therefore there is but little difficulty apparently now in obtaining transportation facilities by railroad.

Items of news are scarce. The stocks of anthracite coal at the trestles are said to be large, but less than corresponding period 1889. The car works here are very busy filling orders, and the news from other points indicate that a like condition of affairs exists generally.

The Lake navigation season closed Monday last, and Buffalo's share of the aggregate traffic is satisfactory. Vessel owners have made some money, and hull underwriters a fair margin of profit. The coal shipments equal those of 1889, the iron ore trade has increased 85% over 1889, the receipts being 535,150 gross tons, as compared with 298,060 gross tons in 1889.

Our neighboring port of Tonawanda shipped only 216 net tons of coal by canal this year.

From a report just issued it appears that there was carried by United States vessels on Lakes Erie, Huron, Michigan, Superior, and Ontario, during the season of 1889, 6,080,697 net tons of coal, and 7,650,455 net tons of iron ore. There passed through St. Mary's River during same year 1,629,197 net tons of coal and 4,095,855 net tons of iron ore. [These figures are in advance of the official census returns.]

Pittsburg. Dec. 11.

(From our Special Correspondent.)

Coal.—Market firm, with a good demand for local purposes. The scarcity of gas has caused hundreds of dwellings to return to coal. There have been no shipments by river owing to the want of water. The amount of coal loaded in the pools and harbor will reach 6,000,000 bushels, to go out the first rise. Current rates:

	Per 100 bushels.		Per 100 bushels.
1st pool	$4.75@$4.80	3d pool	$4.00
2d pool	4.50@4.55	4th pool	3.50

Railroad coal, $5.00@$5.56.

Connellsville Coke.—Demand active; prices unchanged. As usual, cars scarce and furnacemen calling for more coke, which they are not able to obtain. Car shortage on the Pennsylvania Railroad, about 200 cars per day, to say nothing about other roads. The list of idle ovens exceeds 2,000, which will be increased in the near future; active ovens, 14,250; shipments show a material decline. The fire in the Charlotte mine, which was extinguished, has broken out again.

The rates were for 2,000 pounds f. o. b. cars at ovens: Blast furnace coke, $2.15; foundry coke, $2.45; crushed coke, $2.65.

Freights to Pittsburg, 70c. per ton; Mahoning and Shenango Valleys, $1.35; St. Louis, $3.35; Cleveland, $1.70; Chicago, $2.75.

FREIGHTS.

From Philadelphia to: Alexandria, † 85; Boston 1.00@1.15; Galveston, 2.25; New Bedford, 75.; .New York, † .90; Salem, .20; Washington, † .85.

† Alongside.

METAL MARKET.

NEW YORK, Friday Evening, Dec. 12.

Prices of silver per ounce troy.

Dec.	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	Dec.	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
6	4.82	48	1.03½	10	4.81	47¾	1.03¾
8	4.82	47⅞	1.02¼	11	4.83	48	1.04¼
9	4.82	47¾	1.02	12	4.83	48⅛	1.05

Under the impulse of a feeling that additional silver legislation may be accomplished shortly, the price of silver has advanced on speculative purchases. While free coinage may be remote the purchase of the visible surplus stock of bullion is not improbable in the near future. Quite large shipments of gold have been made from the Bank of England to this country during the current week and this will probably relieve the financial situation. Elsewhere we refer editorially to the outlook from the proposed silver legislation.

The United States Assay Office at New York reports the total receipts of silver for the week to be 120,000 ounces.

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Price. H	Price. L.	Sales.
Dec. 6	104⅜	103⅛	90,000
Dec. 8	102¾	101½	249,000
Dec. 9	103¾	102⅛	160,000
Dec. 10	104⅛	103½	156,000
Dec. 11	105¼	104	100,000
Dec. 12	105⅞	104¾	320,000
Total sales			1,075,000

Foreign Bank Statement.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its rate for discount and it remains at 5%. During the week the bank lost £67,000 bullion, but the proportion of its reserve to its liabilities was raised from 45·27% to 46·20% against an advance from 38·06% to 39·18% in the same week last year, when its rate for discount was 5%. The weekly statement of the Bank of France shows a loss of 500,000 francs gold and a loss of 525,000 francs silver, against, for the same week of last year, a loss of 3,575,000 francs gold and 1,650,000 francs silver.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked
Trade dollars	$ .80	$ .83
Mexican dollars	.81	.82½
Peruvian soles and Chilian pesos	.73	.75
English silver	4.80	4.84
Five francs	.94	.95
Victoria sovereigns	4.84	4.93
Twenty francs	3.86	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	1.04⅛	1.05⅛

The stringency in the money market has become more marked than ever during the last one or two weeks, and the banks show a great reserve in serving their customers. The best mercantile paper is almost impossible to discount, even at very high rates, and under the circumstances it is only natural that all commodities had to suffer more or less.

Copper has become very flat, and values are almost nominal for all descriptions. The large lake companies still hold out for 17c., but cannot sell anything at all thereat. Some of the smaller companies have tried to sell at lower figures, and secondhand quantities of lake copper have been offered at as low as 15½c. without finding buyers. It is understood that lake copper is offered rather cheaper for export. There has been practically a standstill, and only limited quantities changed hands. In Arizona copper we have not heard of any transactions, but it could be bought freely at 14½c. for choice brands, and even a little below. Casting copper was selling early in the week at 14c., but it is now also obtainable much cheaper. All parties are now looking for the leading lake companies to come out with their official price, and until that is announced a more settled market cannot be expected.

In Europe, where more free competition exists, the copper market has declined rather materially, and prices for G. M. B., which were left last week at £56, came down from day to day until the lowest was reached to-day with £53@£53 5s. for spot and £53 12s. 6d.@£53 17s. 6d. for three months prompt. Furnace material has been offered at rather low prices, but no business of importance has been reported. Manufacturers and consumers have adopted a waiting policy, and comparatively very little business has been done. The quotations for manufactured copper are more or less nominal.

The exports of copper during the past week were as follows:

	Copper matte.	Pounds.	
To Liverpool:			
S. S. Canada	15 bags	1,500	$100
S. S. City of Chicago	3,281 bags	409,767	35,000
S. S. England	7,636 bags	803,734	75,000
To Hamburg:			
S. S. Suevia	1,229 bags	122,432	10,000
To Hamburg:	Copper bullion.		
S. S. Suevia	10 bars	630	1,200
To Amsterdam:	Copper.		
S. S. Amsterdam	40 bbls.	50,000	8,000
To Rotterdam:			
S. S. Veendam	36 bbls.	56,417	7,500

Tin has been comparatively well sustained in the present general depression and prices have held up fairly well. Spot tin is very scarce, and such orders as are coming in for it can only be filled at about 21½c.@21⅝c., but late December is obtainable from 21c.@21⅛c., and January, February and March delivery at about 20⅛c.@20⅝c. The offers for shipment from the East are made very sparingly, and evidently sellers are holding back in the hope of obtaining better prices on account of the firmer figures for silver and also for better demand after the holidays.

London prices show a decline of about £2 10s. for the week with only moderate sales, the closing prices being spot, £90 10s.@£90 12s. 6d; futures £91 5s.@91 7s. 6d.

Lead.—The conference of the lead and silver smelters, to which we referred last week, evidently did not impress the members very favorably for the outlook of lead, as early in the week every one of them turned out to be an eager seller of lead, and with pretty heavy transactions the prices gave way from day to day until sales have been made here at $4.20@$4.15, with sellers over at the latter figure. This large decline in values has so far not aroused consumers from their lethargy, and they have taken up only small quantities, fearing that the decline has not yet reached the bottom. There have certainly been rather large quantities of lead coming forward, and in the present state of the money market they are somewhat difficult to be taken care of. Future deliveries have now also been offered more freely. We hear that a few hundred tons of foreign lead, which arrived here too late, and the acceptance of which has been refused by the buyers, will be reshipped to Europe; but still large quantities remain in store partly unsold. The European markets have also shown great weakness, and prices of lead have come down in London to £12 5s. for Spanish and £12 10s. for English.

Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "The market is entirely nominal; 4·35c. is asked for desilverized soft Missouri and 4·10c. offered, with no buyers and but few sellers."

St. Louis Lead Market.—Messrs. John Wahl & Co. telegraph us as follows: "Owing to almost a total absence of demand, lead continues to decline. Sales have been made at as low as $3.90. The market closes depressed."

Spelter.—The scarcity of spot spelter has increased, and sales have been made as high as 6¼ for car-load lots, and for near delivery the same price is obtainable, but for late January shipment from the West it is offered at about 6c., and even a trifle below. London quotes £24 for ordinaries and £24 5s. for specials.

Antimony is slow of sale. We quote: Cookson's, 19½; L. X., 18; Hallett's, 17.

Quicksilver.—Owing to tight money quotations have undergone a decline. For London the price is £9 5s., and for New York, $54 to $55. The market is quiet.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Dec. 12.

Nothing could be more wearying and monotonous than the reports in the iron and steel market. It is not any worse this week than it was last, because practically the bottom of dullness was then reached. Even the most cheerful of optimists have given up the expectation of seeing any improvement for some weeks, and content themselves with figuring on future possibilities. The monotony has been slightly relieved by rumors of transactions in round numbers of tons at fair prices, but a careful canvass failed to find any verification of them. It has been stated that the banks are treating the trade well. The statement, however, is scarcely borne out by facts, and what was reported in this connection in this department last week holds good now in every particular. Manufacturers loudly complain that it is difficult to do business as things are. Customers who formerly paid in cash now offer paper—and no one cares to accept that in payment until the financial outlook is somewhat more encouraging. The immediate future condition of the trade depends entirely on the money market.

American Pig Iron.—A telegraphic dispatch from Alabama says that nineteen stacks are out of blast in the Birmingham district, and that consumers have begun looking for iron in other quarters. Whether this will have the effect of stiffening this market remains to be seen. Sales agents here report none but a merely nominal business doing, with buyers still keeping out of the market. The unequal distribution of work among manufacturers is the best evidence that pig iron is comparatively at a standstill. Some of them complain to the sellers of pig iron that the day of 24 hours is not long enough for them. But they are exceptions. Others—and they constitute a majority—are doing very little new business, because it has to be done on such a close margin that it scarcely pays to keep the works open. Neverthe-

less, the production of pig iron still goes on. On December 1st 340 furnaces were in blast, and had produced in November 183,000 tons, as against 178,000 tons in October, with two more furnaces in blast. It is evident that consumption is keeping up, and it is tolerably certain that manufacturers and speculators have not any considerable stocks, which affords a gleam of hope. At present, however, it looks very much like a repetition of last December's experience, when a good spurt and stiffening prices were expected and the demand fell away to nothing. This recalls the predictions of Prophet Beimer, the Illinois farmer. He saw, in his fancy's dream, American pig iron up to $30 a ton in 1890, and '91, and it was to be such a scarce article that people were tumbling over each other to secure it. Ten million tons was a small estimate of the years' production, and the following year the iron trade was to feel the throes of a financial panic. We have had the panic. Mr. Beimer will receive a vote of thanks when the $30 mark is reached. We learn of no sales this week which would have any effect on quotable prices, which remain: Northern iron, No. 1 X, $17.50@$18; No. 2 X, $16.50@$17. Southern, No. 1 X, $16.50@$17.50, and No. 2 X, $15.50@$16.50.

Scotch Pig Iron.—There have been no arrivals during the week, and dealers report no demand or sales. A cargo is daily expected, which is offered, to arrive, at the figures we quote: Eglinton, $20.50@$21; Dalmellington, $22.50; Summerlee, $24.25.

Speigeleisen and Ferro-Manganese.—What few transactions have been consummated have been of very insignificant character. Practically no business is doing in either of these metals, and prices would be to suit individual transactions. Nominal quotations are: 20% spiegeleisen, $30@$30.50; 80% ferromanganese, $67@$68.

Steel Rails.—Business is absolutely stagnant, and in precisely the same condition of uncertainty as last week. The Bethlehem Company has reopened part of its works to complete a pressing order, as indicated in this column last week, and that is the most exciting topic of the day. The figures could not be learned. As the mills are doing little, if anything, sellers are not beating the woods for buyers. If any price may be given, it would be anywhere between the limits of $27.75 and $29, according to quantity and exigency of order. But no orders of any considerable quantity for early delivery are apparently wanted.

Rail Fastenings.—"You can have them at almost any price you like," said a considerable dealer to-day. There is not a buyer in the market, and quotations given must be accepted as those from which a material reduction would be made to secure business. We quote: Spikes, 2·15c.; angle plates, 1·80@1·90c.; bolts and square nuts, 2·75c., hexagonal nuts, 2·95@3c.; complete joint; iron and steel according to weight.

Tubes and Pipes.—The week has developed nothing new, nor is any change desired, as all manufacturers continue as busy as they want to be on orders that will occupy a good slice of the coming year. The last quoted association discounts on car lots continue in force: 47½% on butt, black; 40 on galvanized; 60 on lap, black, and 47½ on lap, galvanized; boiler tubes, 45 on 1¾ inch and smaller; 50 for 2 inches and larger. Casing, all sizes, 50%.

Structural Iron and Steel.—Business continues good, with all manufacturers working up to capacity. Two out-of-town concerns were seeking bids on good orders this week, but existing contracts are so pressing that they could obtain no concessions, and up to this writing had not placed their orders. Present prices are expected to continue for some weeks: Universal plates, $2.30; bridge plates, $2.40; angles, $2.20@$2.30; tees, $2.65; beams, $3.10.

Merchant Steel has just commenced to feel a sympathetic dullness, business having dropped off slightly during the week. Prices, however, have not weakened, and manufacturers are confident that business will hold good until the expected revival. Prices are: Best English tool, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2·60c.; open-hearth spring, 2·60c.; tire steel, 2·60c.; toe calks, 2·60c.; flat file, 4¾c.; mill file, 5¼c.; taper file, 7¼c.; first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—It is stated that a quantity of old rails was offered on the market this week, breaking the price to $22. The assertion lacks corroboration. Those who hold old rails ask $24 for tees and $25 for doubles.

Cleveland. Dec. 12.

(From our Special Correspondent.

The latest reports show aggregate lake shipments of Lake Superior iron ore for the season of 1890 amounting to 8,145,850 gross tons, being a gain of 1,241,339 tons over the shipments of 1889. Add to this the all-rail shipments, which are not yet definitely known, and the total output of this region has probably amounted to 8,500,000 gross tons. This is a larger shipment, by about 250,000 tons, than the best informed ore men ventured to predict last winter.

There are hardly any inquiries at present for iron ores, owing not only to the general dullness, but particularly to the fact that all the furnaces in the Mahoning and Shenango valleys have about made up their minds to stop running on the 1st of January next, unless there will be a reduction in the prices of coke.

We repeat last week's quotations as follows:

Specular and Magnetic Ores.

Bessemer,	66@69	per cent	$6.00
"	60@64	"	5.00@$5.50
Non "	66@69	"	5.00@ 5.50
" "	62@65	"	4.50@ 5.00
" "	57@60	"	3.75@ 4.25

Soft Hematites Dried at 212°.

Bessemer,	62@65	per cent	$4.75@$5.25
"	58@61	"	4.25@ 4.75
Non "	55@63	"	3.50@ 4.25

Above prices are for deliveries on docks at Lake Erie ports.

Louisville. Dec. 9.

[Special Report by Messrs. Hall Bros. & Co.]

Nothing of special note has occurred in this market since our last report. There is a lack of bids for any sized lots, and now business is very slow. Prices are very irregular, and rumors are current of offers being made at figures considerably below what it was thought would be brought about even under a more demoralized condition of the market. The strike in the South among furnaces and coal miners may lead to a hard fight, and we hear that some have ordered their furnaces banked, and doubtless many are glad to do so, as those who have had to sell on such markets as have prevailed during the past few months realize there is little or no margin for the producer above cost. If the strike continues long and the furnaces banked, it will doubtless serve to check any further material decline in prices. An improvement in the condition of financial affairs would be the strongest factor of the situation. Any material improvement, however, in this respect is not looked for by well-informed parties, for a while at least.

Hot Blast Foundry Irons.—Southern coke, No. 1, $15@$15.25; No. 2, $14.25@$14.50; No. 3, $14@$14.25. Mahoning Valley, lake ore mixture, $17.75@$18.75; Southern charcoal, No. 1, $17@$17.50; No. 2, $16.50@$17. Missouri charcoal, No 1, $18@$18.50; No. 2, $17@$17.50.

Forge Irons.—Neutral coke, $13.75@$14; cold short, $13.75@$14; mottled, $12.75@$13.25.

Car Wheel and Malleable Irons.—Southern, standard brands, $22@$23; other brands, $18@$19. Lake Superior, $22.50@$23.

Pittsburg. Dec. 11.

(From our Special Correspondent.)

Raw Iron and Steel.—The past week has been an exceedingly dull one; the reasons for this condition of affairs are various. The unsettled condition of the money market is beginning to be seriously felt in all departments of the trade. There are numerous rumors current concerning some of the big plants that do not read well in print; meetings have been held and arrangements are expected to be consummated that will probably tide them over their present difficulty. Gas and electric stocks, whose par value is $50, can be purchased for $12.75 to $14.00, and very little wanted at any price. This goes to prove that the public has lost confidence and is disposed to stand from under.

The shortage of natural gas continues. Coal and coke are fast becoming the fuel that was lately supplied by gas; besides, the big advance that went into effect on the first of the present month is more than the majority of persons can stand. The iron and steel outlook is far from being favorable. Prices are still on the down grade, while no improvement is looked for during the present year. Below are the prices of Bessemer and Grey Forge for December, past four years:

	1887.	1888.	1889.	1890.
Bessemer	$19.50	$17.25	$24	$16.75@$17
Grey Forge	16.75	15.50	19	14.75@ 15

The above table tells the whole story; Bessemer Pig being $7 per ton below the rates current a year ago and Grey Forge $4.00 and $4.50 per ton lower. Last year the contracts for iron ore were made for several million tons, at one dollar per ton advance. Up to the present time Pittsburg furnaces have made no purchases, nor do they intend to, unless at a material decline from last year's prices. Furnace men here and elsewhere are demanding a reduction in the price of coke and transportation; no decision has yet been arrived at. The Shenango and Mahoning Valley furnacemen still contend that lower prices must come or a shut down will take place in the near future, just as soon as the orders now on the books have been filled. Eastern parties are about closing a contract for a large block of rod billets; prices are said to be low down.

As before remarked, the outlook is a gloomy one; there does not appear to be a redeeming feature in sight. Bessemer pig can be purchased at the lowest figure we have ever reported; Grey Forge is away down; muck bar has started on the down grade followed by blooms, billets and slabs; old iron and steel rails have suffered a further decline; scrap materials, prices uncertain; ferro-manganese can be obtained at a decline from last week's prices; skelp iron is about the only description that holds its own; new steel rails are lower; manufactured iron is without quotable change; nails steady, not very active.

The following sales will best describe the situation:

Coke Smelted Lake and Native Ores.

2,000 Tons Bessemer	$17.00 cash.
2,000 Tons Bessemer, January	16.75 cash.
1,500 Tons Bessemer, Jan., Feb., March	16.75 cash.
1,000 Tons Bessemer, spot	16 65 cash.
750 Tons Grey Forge, December, January	14.65 cash.
500 Tons Grey Forge, January	14.60 cash.
500 Tons Grey Forge	14.50 cash.
500 Tons No. 1 Mill	15.00 cash.
300 Tons No. 1. Foundry	17.00 cash.
100 Tons Silvery	16.50 cash.
100 Tons No. 2 Foundry	16.00 cash.
50 Tons Silvery, extra	19.50 cash.
75 Tons White Iron	14 25 cash.

Charcoal.

100 Tons No. 2 Foundry, Southern	21.00 cash.
75 Tons No. 2 Foundry	22.00 cash.
50 Tons Cold Blast	26.00 cash.
50 Tons No. 1 Foundry	23.50 cash.

Muck Bar.

1,500 Tons Neutral, January, February and March	30.50 cash.
1,000 Tons Neutral	30.25 cash.
1,250 Tons Neutral	30.50 cash.
500 Tons Neutral	30.50 cash.

Steel Slabs and Billets.

1,000 Tons Billets, December	27.00 cash.
750 Tons Billets, spot	26.75 cash.
500 Tons Nail Slabs	26.50 cash.

Skelp Iron.

300 Tons Narrow Grooved	1.97½ 4 m.
200 Tons Wide Grooved	2.02½ 4 m.
300 Tons Sheared Iron	2.30 4 m.

Ferro-Manganese.

200 Tons 80 per cent. January, February and March, seaboard	62.00 cash.

Bloom Ends.

500 Tons Bloom Ends	17.75 cash.

Philadelphia. Dec. 11.

(From our Special Correspondent.)

Pig Iron.—Buyers are liberally supplying themselves with all the iron they need for current wants, as they are satisfied that no decline is probable, especially for good brands. Considering the unsettled condition of the market, prices are remarkably firm. Here and there sales are made below market rates, but special reasons always exist for them. First-class foundry iron readily demands $18, but there are brands selling all the way down to $17. Within the past 48 hours quite a number of inquiries have been received for No. 1, and brokers incline to think from present indications that there will be more business between now and Christmas than they had thought probable two weeks ago. There has also been some improvement in No. 2, and selling prices run from $16 to as high as $17. Several good sales of forge iron have also been made this week, and prices have ranged all the way from $14 up to $15.25. In trade circles there is a better feeling expressed, and it is perhaps due to the fact that people begin to feel easier on money matters. Bessemer is quiet and dull at $18.

Foreign Material.—Two or three lots of spiegel have been asked for; quotations, $31.50@$32. There has been a drop in ferromanganese.

Steel Billets.—There has been a drop in billets, but, instead of the drop resulting in business, it has rather scared buyers off. Two or three parties made an offer to-day of $28; at the same time sales have been made at $1 more. These extreme fluctuations are not regarded as representing market prices. One concern well sold up has refused to quote under $29.50.

Muck Bars.—Manufacturers admit that buyers are quite indifferent about January and February supplies. Mill quotations have been made within a day or so at $28.50.

Merchant Iron.—There is very little new to say. Prices continue at $1.75@$1.95. High expectations are indulged in in regard to general business. The greatest activity will be in common and medium iron.

Sheet Iron.—But little new business has been booked this week. There is a very good feeling in the market, and large contracts are in sight, particularly for galvanized.

Skelp Iron.—Skelp iron has dropped to $1.90, at which some business is being done. Sheared is quoted at $2.10; even at this drop, buyers are waiting to see if they cannot do better.

Wrought Iron Pipe.—An unusual demand for this season continues. Prices are very firm. Quite a number of small buyers were in the market this week, and have placed orders for supplies. A very good feeling exists.

Plate and Tank Iron.—The weakening tendency continues. One buyer claims to have offers for ship plate at 2 cents for iron, 2·20 for steel. Tank, 2 cents to 2·10 for iron, and 2·25 for steel. Notwithstanding the temporary dullness, manufacturers and brokers say there will be a good deal of new business placed immediately after the holidays. Concessions have already been made to secure it, but buyers think it safer to wait a little while.

Structural Iron.—One or two exceptionally large orders have been placed within a few days. While brokers say business from day to day is not very encouraging, they feel confident that January and February orders will fill the mills. Quotations are: $2.20 for angles, $2.30 for plates, $2.70 for tees and $3.10 for beams and channels.

Steel Rails.—The rail mills will shut down as usual for a week or ten days. Quotations have been

made as low as $28.00, but in this branch, like in others, not much business is being done.

Old Rails.—Old rails have dropped to $25.00 at tide-water, but not much business is being done.

Scrap Iron.—Scrap has dropped a little, and sales were made yesterday of No. 1 railroad at $22.50 here.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Dec. 12.

Heavy Chemicals.—This market has, on the whole, been very quiet. Caustic soda has been rather dull owing to the recent large arrivals. Quotations are, for 60%, 3·30@3·35c.; 70 to 74%, 3·10@3·12½c., and 77%, 3·07@3·10c. Carbonated soda ash has also been dull. Quotations in this are: 1·55@1·60c., according to quality, quantity and time of delivery, and spot sales are reported at 1·65@1·70c. Caustic soda ash has been in some demand for future shipments, with quotations, at 1·57½@1·60c. Sal soda has been steady at 1·20@1·25c. for spot goods. To arrive we quote 1·07½@1·10c. Arrivals in bleaching powder have been large and quotations are 1·75c.@1·80c. For contracts extending over 1891 prices have been 1·77½@1·87½c.

Acids.—The topic of discussion among the acid trade during the past week has been the meeting of the Knickerbocker Chemical Company, held on Friday last, at which the Bushwick Chemical Works, the Bayonne Chemical Works, the Phœnix Chemical Works, and the Dundee Chemical Works signified their intention to withdraw from the "combination." During the meeting some amusement was created by the receipt of a sickle made of immortelles and a broken acid carboy draped in mourning. The donor of these emblems has been ascertained to be a member of the Knickerbocker Company. The seceders were interviewed by a representative of the ENGINEERING AND MINING JOURNAL. One of them said: "We withdrew because the whole thing was a dead failure." Another stated that his firm had withdrawn because it had no further use for the "combination." The third man to see the error of his ways, said: "Four members have virtually withdrawn from the Knickerbocker Chemical Company simply because it would be of no benefit to them to continue in it. The members who have staid have contracts with it or have assumed them under its name, and they will remain in it for some time to come, although there is but little doubt that the majority will also withdraw in a short time. The penalty was removed in September, and anybody could sell below schedule prices if he wished to do so. The agreement was never very closely kept. I know at least one present member of the "combination" who went after another member's trade. I do not think the company will go out of existence altogether, because the charter is a good one and it may be preserved by some of the present members.

In our issue of April 5th we gave figures which represented the amount of business done during six months of 1889 by the various firms in the "combination," and which was to form the basis of the quota allowed each member. According to these figures the capacity, sales and value of the works of the Bushwick, Bayonne, Dundee and Phenix Chemical Works, represented fully 40% of the total of the various members of the Knickerbocker Chemical Company. It will thus be seen that the said company is about one-half as strong as it was six months ago, when it was scarcely as strong as the combined forces of the "outsiders."

We foretold all along that the end could not be far off. It is less distant to-day than it ever was. Certain it is that the Knickerbocker Company is almost totally different now from what it was six months ago. No "combination" could exist when it had such strong opponents to combat. The first annual report was submitted to the directors at the last meeting, and it will be presented to the stockholders on the 18th inst.

Business in acids is just now slack. It always is at this time of the year. We quote acid per 100 pounds in New York and vicinity: Acetic, $1.72½@$2.20; muriatic, 18°, 90c.@$1.20; muriatic, 20°, 95c.@$1.50; muriatic, 22°, $1@$1.75; nitric, 36°, $3@$3.25; nitric, 40°, $3.50@$4.50; nitric, 42°, $4@$4.75; sulphuric, 60°, 70@80c., and sulphuric, 66°, 80@$1.

Fertilizing Chemicals.—The market for fertilizers has been quiet during the week. Some small sales are reported at the prices herewith given High grade dried blood, $1.80@$1.85. For the low grade the price is $1.70@$1.75. Azotine, $1.85@$1.90. Tankage, high grade, 9 to 10% ammonia and 15 to 20% phosphate, $19@$20 per ton, and low grade, 7 to 8% ammonia and 25 to 30% phosphate, $18.25@$18.75. Fish scrap, $19@$19.50 per ton f.o.b. factory. Sulphate of ammonia, prime gas liquor, $3.25; prime bone liquor, $3.10@$3.15, with a fair demand. Concentrated tankage, $1.67½@$1.70. Refuse, bone black, guaranteed 70% phosphate, $17@$17.50 per ton. Dissolved bone black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26. Charleston rock, undried, $7@$7.50 per ton; kiln dried, $7 per ton; f. c. b. vessels and cars, $7.25@$7.75, according to time of delivery. Freights by sail from Charleston to New York, $2.75@$3 per ton. Charleston rock, ground, $11.75@$12.25, ex-vessel at New York.

Muriate of Potash.—During the week there have been sales of 500 tons and arrivals of 3,000 tons. Large arrivals will continue to come for some time, inasmuch as the demands warrant them. Quotations are as follows: $1.77½, for New York; $1.80 for Philadelphia; $1.82½ for Southern ports, and $1.85 for Gulf ports.

Nitrate of Soda.—The market has been fairly steady. Sales on the spot are reported at $1.77½@$1.85.

Brimstone. During the week some sales on the spot are reported to have occurred at $29 and $30, but quotations for brimstone to arrive are lower.

For November shipments quotations are $27 for best unmixed seconds, and $26.25 for best unmixed thirds. For December-January shipments quotations are still lower, being $26.50 for best unmixed seconds and $25.75 for best unmixed thirds. Consumers who have all along held off from the market are coming in more freely, though the trading has not been very large.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Dec. 12.

The building material market, owing to the lateness of the season, has been generally quiet.

Bricks.—Arrivals during the week have been pretty large, due to the fine weather, which has permitted shipping. The supply here is consequently large, and the demand has been rather small. Prices are slightly lower than in our last report. We quote this week: Haverstraws, $5.50@$6.50 per M.; uprivers, $5.25@$6; Jerseys, $4.75@$5.75; pale, $2.50@$3.

Lime.—The supply of lime in this market just now is very limited, and furthermore very little is on the way. There has not been much demand; indeed building has pretty much stopped for the year. We quote this week: Rockland lime, common, 90c., and finishing, $1.10; St. John, common and finishing, 85@90c.; Glen Falls, common and finishing, 90c.@$1.10.

Cement.—Very little is doing in cement, and quotations are more or less nominal, as follows: Rosendale, $1@$1.10; Portland, American, $2.25@$2.50; foreign, $2.35@$2.75; special brands, $2.60@$2.85; Roman, $2.80@$3; Keene's coarse, $4.50@$5.50; Keene's fine, $7.25@$8.50 per barrel.

NOTES OF THE WEEK.

Messrs. Peck, Martin & Co., the well-known dealers in brick and building material, yesterday made an assignment to George S. Hamlin. The firm's estimated liabilities are $300,000, and it is stated that the assets ought to reach $400,000. The difficulty in collecting outstanding debts is given as the cause of the assignment. The firm, as organized, has been in existence about eight years and has stood at the head of the business.

IMPORTS AND EXPORTS OF METALS AT NEW YORK FROM NOVEMBER 29 TO DECEMBER 6 AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co....	.....	422
Hendricks Bros....	.....	50
La Marche's Sons, H....	.....	5
Lewisohn Bros....	25	175
Meyer, G. A. & E..	.....	9
Milne & Co.....	.....	74
Muller, Schall & Co.....	.....	128
Total.....	25	863
Corres. date, 1889..	.....	794
Pig Lead.	Lbs.	Lbs.
Amer. Metal Co....	546	2,345
Atlantic W. Lead Co.	200	400
Bruce & Cook.....	.....	125
Caswell, E. A.....	.....	211
Hendricks Bros...	50	200
Hooper, B. F.....	.....	100
Leroy Shot & L. Co.	.....	95
Naylor & Co.....	.....	10
Paulsen, Wm.....	100	800
Schultz & Co., A....	.....	98
Sheldon, G. W.....	.....	149
Tatham Bros.....	200	395
Total.....	1,096	4,928
Corres. date, 1889..	.....	262
Tin.	Tons.	Tons.
Abbot, Jere, & Co.	.....	225
Amer. Metal Co....	25	2,966
Bidwell & French.	.....	1,480
Bruce & Cook.....	.....	20
Carter, Hawley & Co	.....	80
Cohn & Co., A.....	.....	20
Cohen, H.....	.....	20
Cort & Co., N. L...	.....	175
Crooke Smelting & Ref. Co.....	.....	6
Crooks & Co., R...	.....	85
Davol & Son.....	.....	51
Hendricks Bros....	.....	64
Knauth & Kuhne..	.....	10
Lehmaier, S., & Co.	18	213
Lewisohn Bros....	.....	120
Merchant & Co ..	.....	115
Muller, Schall & Co.	.....	1,000
Naylor & Co.....	9	1,568
Nissen, Geo.....	.....	10
Phelps, Dodge & Co	65	4,221
Pope, Thos. J. Sons.	.....	10
Schultz & R.....	.....	75
Thomson, A. A. & Co	.....	124
Thomson, D. & Co.	10	134
Tompkins, Geo. V.	.....	10
Townsend, & Co., J. R.	.....	50
Trotter & Co, N..	.....	75
Total.....	127	12,983
Corres. date, 1889..	566	11,866

Tin Plates.	Boxes.	Boxes.
Adams & West'keCo.....		70
Bruce & Cook.....	3,274	130,386
Byrne & Son.....	.....	1,000
Central Stamp. Co.	1,753	61,354
Coddington & Co...	5,531	153,960
Cohn & Co	2,648	20,461
Con. Fruit Jar Co.		120
Corbuere F. & Co..	813	9,300
Cort & Co.....	5,722	220,460
Crooks & Co.....	5,061	105,856
De Milt & Co., H. R.		14,539
Dickerson, V. D. & Co	7,159	364,310
Fenton, D. E.....	.....	4,491
Haberman, F.....	.....	66
Herring, Chas. E....	.....	1,000
Iron Clad Mfg. Co.	.....	597
Lalance & G. M. Co.	.....	9,118
Lazard Bros.....	.....	1,048
Lehmaier, Schw'z & Co...		200
Merchant & Co....	2,376	31,796
Mersick & Co. ..	962	14,664
Morewood & Co...	1,323	42,062
Newell Bros.....	.....	416
Payne, S. H. & Co.		934
Pratt Mfg. Co.....	.....	95,271
Phelps, Dodge & Co	10,412	774,732
Schneider & Co., J.		3,365
Shepard & Co., S....	.....	15,927
Shepherd & Co., W....	.....	500
Standard Oil Co. .	11,181	51,808
Taylor, N. & G....	.....	1,429
Thomson & Co., A. A.	2,988	103,503
Warren, J. M.....	.....	5,771
Wheeler & Co.....	1,089	32,465
Whittemore & Co.	565	16,173
Wolff & Reesing...	.....	2,077
Wright, Peter & Co.		227
Total.....	62,857	2,273,810
Corres. date, 1889..	24,905	2,119,042

Pig Iron.	Tons.	Tons.
Abbott & Co, Jere		250
Baldwin & Co., A..		807
Baldwin Bros. & Co.....		170
Bartlett, N. S.....		100
Crocker Bros.....		1,515
Crooks & Co., R.....		5
Dana & Co..		150
Drummond & Co		600
Geisenheimer & Co		76
Hagermeyer & Brun		30
Henderson Bros.		330
Irvin. R. I. & Co		400
Lillienberg, N.....		2,409
Naylor & Co.....		150
Perry & Reyer.....		53
Pierson & Co.....		30
Sheldon, G. W. & Co.		200
Stetson & Co., G. W.	300	3,325
Williamson, J. & Co.	250	2,400
Total.....	550	13,000
Corres. date, 1889...	300	30,594
Steel Blooms, Billets, and Slabs.	Tons.	Tons.
Abbott & Co.....	508	1,219
Baldwin Bros. & Co.....		2
Dana & Co.....		1,670
Dolge & Co., A.....		1
Downing, R. F. & Co.		109
Henderson Bros.....		1
Holt & Co., H. N.....		4
Martin & Co		80
Milne, A., & Co.. ..		275
Naylor & Co.....		3,444
Pope, Jas. E., Jr.		61
Richards & Co., C. B.		1
Roebling's Sons, J. A.....		2,074
Ward & Co., J. C..		198
Wolff, & Co., R. H.		60
Total.....	508	9,199
Corres. date, 1889...	150	28,191
Bar Iron.	Tons.	Tons.
Abbott & Co., Jere.	105	1,026
Bacon & Co.....		1,319
Crocker Bros.....		77
Dickerson, Van Dusen & Co.....		6
Downing & Co.....		335
E. J. Jacobus.	3	107
Fuller, Dana & Fitz.		11
Holt, H. N..... ..		230
Lillienberg, N.....	10	566
Lundberg, G.....	59	3,174
Milne & Co.....		2,060
Muller, Schall & Co.		606
Naylor & Co.....		1,213
Page, Newell & Co.		1,855
Plenty, J		23
Wilson, J. G.....		3
Total.....	177	12,611
Corres. date, 1889...	433	14,233
Scrap Iron.	Tons.	Tons.
Baldwin Bros. & Co.....		7
Chapman, Mitchell & Co.....		120
Crossman & Co., W. H.....		117
Frankfort, M.....		447
Gordon, G. O.....		1,436
Leary, D.....		27
McDougall & Potter.....		92
Muller, Schall & Co		18
Pierson, C. L.....		161
Samper & Co., S.		186
Stevens, Corvin & Co.....		30
Ward, J. E. & Co..		884
Total.....		3,365

Steel and Iron Rods.	Tons.	Tons.
Abbott & Co.....	368	10,650
American S. Co.....		865
Bacon & Co.....	5	551
Bunnell & Co., J. H.		50
Carey & Moen Co..	34	603
Cooper, Hewitt & Co.....		371
Dana & Co.		1,553
Dodge & Co., A..		3
Downing & Co....		135
Galpin, S. A.....		1,241
Greely & Co, E. S.		35
Hastings, W. & S.....		4
Hazard Mfg. Co		618
Holt & Co., H. N..		3
Jacobus, E. Y.....		8
Lee, J. & Co.....		1,852
Lillienberg, N.		300
Lundberg, G.....		157
Lundell, C. G		5
Milne & Co.....		1,945
Muller, Schall & Co.		850
Naylor & Co.....	333	7,831
Page, Newell & Co.		1,803
Roebling's Sons, J. A.....		2,937
Sanderson & Son..		1
Schulze & R.....		251
Taylor, N. L.....		16
Temple & Lockw'd		6
Wallace, W.....		5
Wessel & Co.....		21
Wiebusch & Ho...		4
Wilson, I. M.....		29
Wood & Niebuhr..		25
Wolf & Co., R. H.. 58		3,557
Total.....	798	38,265
Corres. date, 1889..	274	43,640
Old Rails.	Tons.	Tons.
Bowring & Archibald.....		340
Dana & Co.....	440	1,219
Frankfort, M....	885	10,412
Henderson Bros.... ...		300
Hernsheim, L		350
Mosle Bros.		123
Naylor & Co.....		3,099
Sawyer, Wallace & Co....		610
West, H.....		398
Wiechers, J. F.....		600
Total.....	1,325	17,451
Corres. date, 1889..		10,609
Spiegeleisen.	Tons.	Tons.
Abbott, Jere & Co.		2,725
American Metal Co.....		100
Blakely & McLellan.....		1,684
Crocker Bros	702	26,098
Crooks & Co. R...		106

Dana & Co.....	10	15,975
Foley, F.....		50
Geisenheimer & Co.		1,155
Henderson Bros. & Co.....		14
Hernsheim, L.	340	22,224
Holt, H. N..		20
Irvin & Co., R. I..		50
Naylor & Co.....		13,158
Perkins, C. L.....		1,452
Sachs & Richmond.		2
Whittemore, H. & Co.		95
Total.....	712	84,088
Corres. date, 1889...		72,258
Iron Ore.	Tons.	Tons.
Balz, Jacob.....		67
Bergen Point Chemical Co.....		4,950
Bowring & Archibald.....		5,292
Earnshaw, A.....	521	4,677
Ennis, Andrew.....		438
Flores & Co., R. de		14,143
Hill, Frank.....		700
Johnson & Co., L..		5,030
Total.....	521	35,297
Corres. date, 1889..		12,001

EXPORTS.

From Jan. 1 to Nov. 1, 1890.

Copper.	Pounds.	Pounds.
Abbott & Co., Jere.		3,061,058
Amer. Met. Co., L..		940,385
Barber & Co		13,750
Belmont, Aug. & Co		1,125,901
Boker, C. F.....		202,500
Burgass & Co.....		454,953
Funch, Edye & Co.....		135,374
Heidelbech, Ichelheimer & Co		672,608
Lewisohn Bros....		251,478
Muller, Schall & Co.....		33,750
Paulsen, Wm....		50,000
Sawyer, W'l'ce & Co.....		22,796
Seamen, S. H.....		66,950
Ward, J. E. & Co.		100,000
Wiechers, J. F		41,407
Wil'ms & T'hune..		112,004
Total.....		7,274,914
Corre. date, 1889.	2,088,338	14,778,364
Copper Matte.		
American Metal Co		3,072,079
Lewisohn Bros.		6,333,600
Nichols, Geo. H... ..		267,202
Paulsen, Wm...		1,149,592
Wil'ms & T'hune..		2,848,706
Total.....		13,671,170
Corres. date 1889.	2,924,389	34,901,130

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and Amount of last		Dividends. Total paid.	Dividends. Date & amount of last.		
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*	.....	.....	$555,000	Jan.	1887	.10
2	Alice, s. c.	Mont.	10,000,000	400,000	25	*	.....	.....	870,000	Dec.	1890	.05
3	Alma&Nel Wood C.,g	Idaho	300,000	30,000	10	*	.....	.....	60,000	Jan.	1889	.50
4	American & Nettie,c.	Colo.		300,000			.....	.....	150,000	Nov.	1889	.10
5	Amy & Silversmith,s.	Mont.		341,419			.....	.....	247,380	Aug.	1887	12½
6	Atlantic, c.	Mich.	1,000,000	40,000	25	$280,000	April	1875	$1.00 660,000	Aug.	1890	1.00
7	Argenta, s.	Nev.	10,000,000	100,000	100	335,000	July	1889	.10 40,000	Feb.	1890	.20
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*	.....	.....	560,000	Dec.	1890	.10
9	Aurora, I.	Mich.	2,000,000	100,000	20		.....	.....	155,000	Oct.	1887	1.87½
10	Badger, s.	Ont.	250,000	50,000	5		.....	.....	37,500	Mar.	1880	.25
11	Bassick, g. s.	Colo.	10,000,000	100,000	100	*	.....	.....	400,000	Mar.	1884	1.00
12	Belle Isle, s.	Nev.	10,000,000	100,000	100	190,000	Dec.	1889	.15 300,000	Dec.	1879	.25
13	Belcher, g. s.	Nev.	10,400,000	104,000	100	2,978,000	June	1890	.50 15,397,000	April	1876	1.00
14	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25 200,000	Jan.	1887	.10
15	Bi-Metallic, s.	Mont.	5,000,000	200,000	25		.....	.....	270,000	Nov.	1890	.35
16	Bodie Con., g. s.	Cal.	10,000,000	100,000	100	575,000	Nov.	1889	.25 1,602,572	April	1885	.50
17	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*	.....	.....	520,000	June	1886	1.15
18	Boston & Mont., c. s.	Mont.	2,500,000	100,000	25	*	.....	.....	1,450,000	Aug.	1890	.50
19	Breese, s.	Colo.	5,000,000	200,000	25	*	.....	.....	2,300	Feb.	1880	.01
20	Brooklyn Lead, L. s.	Utah	500,000	50,000	10		.....	.....	127,000	July	1887	.05
21	Bulwer, g.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25 175,000	Jan.	1884	.10
22	Bunker Hill & Sull.	Idaho	3,000,000	300,000	10	*	.....	.....	750,000	Oct.	1883	.06⅔
23	Caledonia, g.	Dak.	10,000,000	100,000	100	505,000	May	1885	.15 194,000	Oct.	1890	.08
24	Calliope, s.	Utah	1,000,000	1,000,000			.....	.....	38,000	April	1890	.01
25	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	1,200,000	.....	.....	34,350,000	May	1890	5.00
26	Carbonate Hill, s. L.	Colo.	1,500,000	300,000	10	*	.....	.....	80,000	April	1884	.05
27	Carlisle, g.	N. M.	1,000,000	200,000	5		.....	.....	175,000	Dec.	1888	.12½
28	Castle Creek, g.	Idaho	100,000	100,000	1		.....	.....	51,000	Oct.	1883	.03
29	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*	.....	.....	270,000	May	1884	.10
30	Central, c.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65 1,350,000	Feb.	1890	1.00
31	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	1,650,000	Dec.	1884	.25
32	Colorado Central, s.L.	Colo.	2,750,000	275,000	10	*	.....	.....	406,250	Aug.	1889	.05
33	Commonwealth, s.	Nev.	10,000,000	100,000	100	170,000	Nov.	1888	.50 20,000	Nov.	1890	.20
34	Confidence, s. L.	Nev.		24,960		328,883	May	1890	.75 199,68	April	1889	1.00
35	Cons. Cal. & Va., g. s.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20 3,466,80	April	1890	.25
36	Contention, s.	Ariz.	12,500,000	250,000	50		.....	.....	12,587,500	Dec.	1884	.25
37	** Cop. Queen Con., c.	Ariz.	1,400,000	140,000	10		.....	.....	210,000	Feb.	1889	.50
38	Crescent, s. L. g.	Utah	15,000,000	600,000	25	*	.....	.....	228,000	Oct.	1888	.03
39	Crown Point, g. s.	Nev.	10,000,000	100,000	100	2,425,000	Sept.	1889	.50 11,588,000	Jan.	1875	2.00
40	Daly, s. L.	Utah	3,000,000	150,000	20		.....	.....	1,706,500	Nov.	1890	.25
41	Deer Creek, s. g.	Idaho	1,000,000	200,000	5	*	.....	.....	20,000	June	1889	.05
42	Deadwood-Terra, g.	Dak.	5,000,000	200,000	25	*	.....	.....	41,000,000	Nov.	1887	.10
43	Derbec B. Grav., g. s.	Dak.	10,000,000	100,000	100	90,000	Dec.	1881	.10 240,000	Oct.	1890	.10
44	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*	.....	.....	390,000	Oct.	1889	.05
45	Dunstone, g. s. L.	Mont.	1,000,000	200,000	5	*	.....	.....	6,000	Nov.	1888	.03
46	Eclipse.	Colo.	100,000	100,000	1		.....	.....	20,000	Nov.	1887	.10
47	Elkhorn, g. s.	Mont.	1,000,000	100,000	10	50,000	July.	1883	.50 850,000	July.	1887	.05
48	Empire Lt., g.	Mont.	500,000	100,000	5		.....	.....	70,500	Oct.	1887	.37½
49	Eureka Con., g. s. L.	Nev.	5,000,000	50,000	100	550,000	June	1889	.50 4,892,500	Oct.	1890	.25
50	Evening Star, s. L.	Colo.	500,000	50,000	10	*	.....	.....	1,458,000	Dec.	1889	.25
51	Excelsior, g.	Cal.	10,000,000	100,000	100	560,000	Sept.	1885	1.00 875,000	Oct.	1890	.25
52	Father de Smet, g.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00 1,125,000	Dec.	1885	.20
53	Franklin, c.	Mich.	1,000,000	40,000	25	220,000	June	1871	 960,000	Jan.	1889	2.00
54	Freeland, g. s. c.	Colo.	5,000,000	200,000	25	*	.....	.....	190,000	July.	1886	.10
55	Garfield Lt., g. s.	Nev.	500,000	100,000	5		.....	.....	95,000	April	1888	.12½
56	Gould & Curry, g. s.	Nev.	10,800,000	108,000	100	3,988,800	Sept.	1890	.25 2,826,000	Oct.	1870	10.00
57	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30 525,000	Jan.	1890	.30
58	Granite, s. L.	Idaho	500,000	500,000	1	*	.....	.....	28,400	Oct.	1889	.02
59	Granite Mountain, s.	Mont.	10,000,000	400,000	25		.....	.....	10,200,000	Dec.	1890	.50
60	Green Mountain, g.	Cal.	1,250,000	125,000	10	*	.....	.....	212,000	Nov.	1881	.07½
61	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,142,800	April	1890	.50 1,162,000	July.	1888	.50
62	Hecla Con., s. g. L. c.	Mont.	1,500,000	30,000	50		.....	.....	1,500,000	April	1889	.50
63	Hel'a Mg.& Red, g.s.L.	Mont.	3,315,000	663,000	5	*	.....	.....	197,979	July.	1886	.06
64	Holmes, s.	Nev.	10,000,000	100,000	100	370,000	May.	1890	.25 75,000	April	1886	.25
65	Holyoke, g.	Idaho	200,000	200,000	1		.....	.....	27,000	Feb.	1883	.10
66	Homestake, g.	Dak.	12,500,000	125,000	100	200,000	July.	1878	1.00 5,606,250	Nov.	1890	.10
67	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30 525,000	Jan.	1890	.30
68	Granite, s. L.	Idaho	500,000	500,000	1	*	.....	.....	28,400	Oct.	1889	.02
69	Granite Mountain, s.	Mont.	10,000,000	400,000	25		.....	.....	10,200,000	Dec.	1890	.50
70	Green Mountain, g.	Cal.	1,250,000	125,000	10	*	.....	.....	212,000	Nov.	1881	.07½
71	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,142,800	April	1890	.50 1,162,000	July.	1888	.50
72	Hecla Con., s. g. L. c.	Mont.	1,500,000	30,000	50		.....	.....	1,500,000	April	1889	.50
73	Hel'a Mg.& Red, g.s.L.	Mont.	3,315,000	663,000	5	*	.....	.....	197,979	July.	1886	.06
74	Holmes, s.	Nev.	10,000,000	100,000	100	370,000	May.	1890	.25 75,000	April	1886	.25
75	Holyoke, g.	Idaho	200,000	200,000	1		.....	.....	27,000	Feb.	1883	.10
76	Homestake, g.	Dak.	12,500,000	125,000	100	200,000	July.	1878	1.00 5,606,250	Nov.	1890	.10
77	Honorine, s. L.	Utah	500,000	250,000	2	37,500	April	1889	.05 125,000	Sept.	1887	.05
78	Hope, s.	Mont.	1,000,000	100,000	10	*	.....	.....	253,255	April	1888	.25
79	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*	.....	.....	4,150,000	June	1890	.12½
80	Hubert, g.	Colo.	1,000,030	1,000,000	1	*	.....	.....	247,000	Dec.	1889	.00½
81	Idaho, g.	Cal.	310,000	3,100	100		.....	.....	5,235,900	Dec.	1889	5.00
82	Ideal, s. L.	Colo.	1,500,000	50,000	10		.....	.....	15,000	Oct.	1886	.05
83	Illinois, s.	N. M.	100,000	100,000	1	*	.....	.....	45,000	April	1889	.20
84	Independence, s.	Nev.	10,000,000	100,000	100	340,000	Oct.	1886	.20 225,00	sept.	1879	.25
85	Iron Hill, s.	Dak.	2,500,000	250,000	10	134,000	July.	1889	.03 156,250	Nov.	1887	.07½
86	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20	*	.....	.....	2,500,000	April	1889	.20
87	Jackson, g. s.	Nev.	5,000,000	50,000	100	237,500	Nov.	1880	.20 55,000	June	1889	.10
88	Jay Gould.	Mont.	2,000,000	40,000	5	*	.....	.....	459,000	May	1890	.04
89	Jocuistita, L.	Mex.	2,500,000	250,000	10		.....	.....	1,200,000	Feb.	1885	.50
90	Jumbo, g.	Colo.	2,000,000	200,000	10		.....	.....	35,000	Oct.	1887	.02½
91	Kearsarge, c.	Mich.	1,250,000	50,000	25	190,000	Oct.	1887	1.00 100,000	Jan.	1890	2.00
92	Kentuck, g.	Nev.	3,000,000	30,000	100	406,330	Aug.	1890	.30 1,350,000	Dec.	1886	.10
93	La Platta, s. L.	Colo.	2,000,000	200,000	10	*	.....	.....	610,000	Sept.	1882	.30
94	Leadville Con., s. L. I.	Colo.	4,000,000	400,000	10	*	.....	.....	4,423,000	April	1889	.05
95	Lexington, g. s.	Mont.	4,000,000	40,000	100	*	.....	.....	608,000	Jan.	1885	2.00
96	Little Chief, s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	820,000	Dec.	1890	.05
97	Little Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*	.....	.....	1,000,000	Mar.	1890	.50
98	Little Rule.	Colo.	500,000	500,000	1		.....	.....	30,000	June	1890	.02
99	Mammoth.	Utah	10,000,000	400,000	25		.....	.....	480,000	Aug.	1890	.10
90	Martin White, s.	Nev.	10,000,000	100,000	100	1,225,000	Oct.	1890	.25 140,000	Dec.	1886	.25
91	Mary Murphy, g. s.	Colo.	350,000	3,500	100	*	.....	.....	175,000	May	1888	5.00
92	Matchless, s.	Colo.	500,000	500,000	1	*	.....	.....	15,000	Feb.	1890	.00½
93	May Mazeppa.	Colo.	1,000,000	100,000	1		.....	.....	40,000	Dec.	1890	.01
94	Minnesotta, c.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00 1,820,000	Mar.	1876	.....
95	Mono, g.	Cal.	5,000,000	50,000	100	760,000	Sept.	1890	.25 12,500	Mar.	1886	.25
96	Montana, Lt., g. s.	Mont.	3,300,000	660,000	5	*	.....	.....	2,489,675	Oct.	1890	.06
97	Morning Star, s. L.	Colo.	1,000,000	100,000	10		.....	.....	850,000	Dec.	1889	.20
98	Moulton, s. G.	Mont.	2,000,000	400,000	5	*	.....	.....	380,000	Dec.	1887	.07½
99	Mount Pleasant, g.	Cal.	150,000	150,000	1	*	.....	.....	150,000	Feb.	1887	.30
100	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00 160,000	Oct.	1889	.20
101	Napa, g.	Cal.	700,000	100,000	7		.....	.....	380,000	Oct.	1890	.10
102	Navajo, g. s.	Nev.	10,000,000	100,000	100	500,000	April	1890	.15 365,000	April	1889	.10
103	New Guston, s.	Colo.	500,000	100,000	5	*	.....	.....	337,500	April	1890	.50
104	N. Hoover Hill, g. s.	N. C.	330,000	120,000	2½	*	.....	.....	30,000	Dec.	1885	.06⅔
105	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00 2,400,000	April	1883	.50
106	North Belle Isle, s.	Nev.	10,000,000	100,000	100	385,000	April	1890	.20 280,000	May	1888	.50
107	North Star, g.	Cal.	1,000,000	100,000	10		.....	.....	250,000	Dec.	1889	.50
108	Ontario, s. L.	Utah	15,000,000	150,000	100		.....	.....	11,450,000	Nov.	1890	.50
109	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50 1,595,800	July	1882	1.00
110	Original, s. c.	Mont.	1,500,000	60,000	25	*	.....	.....	123,000	July.	1888	.05
111	Oro	Colo.	503,000	400,000	5		.....	.....	60,000	June	1890	.20
112	Osceola, c.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60 1,447,500	Dec.	1890	1.50
113	Oxford, c.	N. S.	125,000	125,000	1	*	.....	.....	75,500	Sept.	1888	.02
114	Paradise Valley, g. s.	Nev.	10,000,000	100,000	100	57,000	April	1888	.15 150,000	April	1887	.10
115	Parrot, c.	Mont.	1,800,000	180,000	10		.....	.....	696,000	Sept.	1890	.10
116	Peacock, s. g. c.	N. M.	2,000,000	200,000	10	*	.....	.....	60,000	Nov.	1886	.....
117	Plumas Eureka, g.	Cal.	1,406,250	140,625	10	*	.....	.....	2,548,046	Oct.	1889	.37½
118	Plutus, g. s. c. L.	Colo.	2,000,000	200,000	10	*	.....	.....	20,000	Feb.	1886	.10
119	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*	.....	.....	2,280,000	Feb.	1888	.40
120	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100		.....	.....	1,705,791	Aug.	1890	1.50
121	" com., Q.	Cal.	5,700,000	57,000	100		.....	.....	643,867	July.	1882	.40
122	Quincy, c.	Mich.	1,000,000	40,000	25	200,000	Dec.	1862	 5,570,000	Aug.	1890	5.00
123	Republic, c.	Mich.	5,000,000	100,000	50	400,000	Dec.	1889	.30 4,312,587	June	1887	1.25
124	Richmond, s. L.	Nev.	1,350,000	54,000	25	*	.....	.....	99,785	Feb.	1890	.50
125	Ridge, c.	Mich.	500,000	23,000	25	219,939	Mar.	1886	.50 585,000	Mar.	1886	.05
126	Robinson Con., s. L.	Colo.	10,000,000	200,000	50	*	.....	.....	100,000	Mar.	1882	.50
127	Robert E. Lee, s. L.	Colo.	10,000,000	500,000	20		.....	.....	4,460,000	July.	1869	3.00
128	Savage, s.	Nev.	11,200,000	112,000	100	6,604,000	Nov.	1889	.50 7,500	April	1883	.01
129	Shoshone, g.	Idaho	150,000	150,000	1		.....	.....	1,568,145	April	1888	.12½
130	Sierra Buttes, g.	Cal.	2,225,000	122,500	10		.....	.....	102,000	Jan.	1871	1.00
131	Sierra Nevada, g. s.	Nev.	10,000,000	100,000	100	6,236,910	May.	1890	.50 270,000	April	1889	.10
132	Sierra Nevada, s. L.	Idaho	1,000,000	1,000,000		*	.....	.....	40,000	May.	1889	.02
133	Silver Cord, g. s. L.	Colo.	4,500,000	450,000	10		.....	.....	220,000	April	1889	.10
134	Silver King, s.	Ariz.	10,000,000	100,000	100	130,000	Sept.	1890	.30 1,950,000	July.	1887	.25
135	Silver Mg. of L. V.	N. M.	500,000	500,000	1		.....	.....	275,000	Dec.	1890	.05
136	Silverton, g. s. L.	Colo.	2,000,000	200,000	10	*	.....	.....	50,000	Jan.	1881	.25
137	Small Hopes Con., s.	Colo.	5,000,000	250,000	20	*	.....	.....	2,162,500	Oct.	1890	.25
138	Spring Valley, g.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25 3,595,000	June	1888	.05
139	Standard, g. s.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50 155,500	Nov.	1881	.15
140	Stormont, s.	Utah	500,000	500,000	1	*	.....	.....	844,000	Dec.	1887	.20
141	St. Joseph, L.	Mo.	1,500,000	150,000	10	*	.....	.....	9,000	April	1888	.02½
142	Swansea, g.	Colo.	600,000	60,000	10	*	.....	.....	100,000	Nov.	1881	.20
143	Tamarack, c.	Mich.	1,000,000	40,000	25	520,000	April	1885	3.00 1,670,000	Oct.	1890	4.00
144	Tombstone, g. s. L.	Ariz.	12,500,000	500,000	25	*	.....	.....	1,250,000	April	1882	.10
145	United Verde, c.	Ariz.	5,000,000	300,000	10	*	.....	.....	97,500	Feb.	1884	.10
146	Valencia, M.	N. M.	150,000	1,500	100		.....	.....	41,250	April	1886	2.50
147	Viola Lt., s. L.	Idaho	750,000	150,000	5		.....	.....	272,500	Oct.	1887	.37½
148	Ward Con., s. L.	Colo.	2,000,000	200,000	10		.....	.....	20,000	Dec.	1889	.05
149	Yankee Girl.	Colo.	2,500,000	250,000	10		.....	.....	1,275,000	July.	1887	.10
150	Yellow Jacket, g. s.	Nev.	12,000,000	120,000	100	5,508,000	Mar.	1889	.50 2,148,000	Aug.	1871	1.50
151	Weeb City, L. z.	Mo.	55,000	11,000	5		.....	.....	4,400	July.	1889	.10
152	Woodside.	Utah					.....	.....	25,000	Oct.	1889	.25
153	Young America.	Cal.					.....	.....	175,000	.....	1889	.10

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and am't of last.		
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*	.....	.....	
2	Allegheny, s.	Colo.	5,000,000	500,000	10		.....	.....	
3	Allouez, c.	Mich.	2,000,000	80,000	25	$737,000	Jan.	1890	.70
4	Alpha Con., g. s.	Nev.	3,000,000	30,000	100	112,500	Sept.	1890	.25
5	Alta, s.	Nev.	10,080,000	100,800	100	3,359,800	Sept.	1890	.50
6	Amador, g.	Cal.	400,000	200,000	2	*	.....	.....	
7	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	June	1887	
8	Amity, s.	Colo.	250,000	250,000	1		.....	.....	
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5		.....	.....	
10	Astoria, g.	Cal.	200,000	100,000	2		.....	.....	
11	Barcelona, s.	Nev.	5,000,000	300,000	25		.....	.....	
12	Bechtel Con., g.	Cal.	10,000,000	100,000	100	173,500	Jan.	1883	.10
13	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	April	1886	.10
14	Best & Belcher, g. s.	Nev.	10,080,000	100,800	100	2,279,275	Aug.	1890	.25
15	Big Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*	.....	.....	
16	Black Oak, g.	Cal.	3,000,000	300,000	10	*	.....	.....	
17	Boston Con., g.	Cal.	10,000,000	100,000	100	170,000	Nov.	1883	.25
18	Bremen, s.	N. M.	5,000,000	500,000	10	*	.....	.....	
19	Brownlow, s.	Colo.	250,000	250,000	1		.....	.....	
20	Brunswick, g.	Cal.	2,000,000	400,000	5	*	.....	.....	
21	Bullion, g. s.	Nev.	10,000,000	100,000	100	2,790,000	Dec.	1889	.25
22	Butte & Boston, c. s.	Mont.	5,000,000	200,000			.....	.....	.25
23	Calaveras, g.	Cal.	300,000	500,000	1	*	.....	.....	
24	Carisa, g.	Wy.	500,000	100,000	5	*	.....	.....	
25	Carupano, g. s. L. c.	Ven.	200,000	100,000	2	*	.....	.....	
26	Cashier, g. s.	Colo.	500,000	250,000	2	*	.....	.....	
27	Charles Dickens, g. s.	Idaho	1,250,000	250,000	5	*	.....	.....	
28	Cherokee, g.	Cal.	1,500,000	150,000	10		.....	.....	
29	Chollar, s.	Nev.	11,200,000	112,000	100	1,540,000	Nov.	1889	.50
30	Cleveland, T.	Dak.	1,000,000	500,000	2	*	.....	.....	
31	Colchis,	N. M.	500,000	50,000	10		.....	.....	
32	Comstock, g. s.	Nev.	10,000,000	100,000	100	35,000	Mar.	1887	.15
33	Con. Imperial, g. s.	Nev.	5,000,000	50,000	100	1,875,000	July.	1890	.05
34	Con. Pacific, g.	Cal.	6,000,000	60,000	100	198,000	June	1890	.10
35	Con. Silver, s.	Mo.	2,500,000	250,000	10		.....	.....	
36	Crescent, s. L.	Utah	3,000,000	300,000	10	*	.....	.....	
37	Crocker, s.	Ariz.	10,000,000	100,000	100	150,000	June	1890	.15
38	Crowell, g.	N. C.	500,000	500,000	1		.....	.....	
39	Dahlonega, g.	Ga.	250,000	250,000	1	*	.....	.....	
40	Dandy, s.	Colo.	5,000,000	500,000	10		.....	.....	
41	Decatur, s.	Colo.	1,500,000	300,000	5	*	.....	.....	
42	Denver City, s. L.	Colo.	5,000,000	500,000	10	*	.....	.....	
43	Denver Gold, g.	Colo.	300,000	60,000	5		.....	.....	
44	Durango, g.	Colo.	500,000	500,000	1	*	.....	.....	
45	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
46	El Cristo, g. s.	U.S.C.	1,000,000	500,000	2		.....	.....	
47	El Dorado, g.	Cal.	1,000,000	250,000	4	*	.....	.....	
48	El Talento, g.	Cal.	1,000,000	500,000	2		.....	.....	
49	Empire, g.	Utah	10,000,000	100,000	100		.....	.....	
50	Eureka Tunnel, s. L.	Nev.	10,000,000	100,000	100	*	.....	.....	
51	Exchequer.	Nev.	10,000,000	100,000	100	865,000	July.	1890	.25
52	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	81,500	May.	1890	.25
53	Gogebic I. Syn., I.	Wis.	5,600,000	200,000	25	*	.....	.....	
54	Gold Cup, s.	Colo.	500,000	500,000	1	*	.....	.....	
55	Golden Era, s.	Mont.	2,000,000	200,000	10	*	.....	.....	
56	Gold Placer, g.	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.25
57	Gold Rock, g.	Cal.	1,000,000	500,000	2	*	.....	.....	
58	Goodshaw, g.	Cal.	10,000,000	100,000	100	*	.....	.....	
59	Grand Belt, c.	Tex.	12,000,000	120,000	100		.....	.....	
60	Grand Duke.	Colo.		800,000	10		.....	.....	
61	Grand Remanso, g. s.	U.S.C.	1,000,000	500,000	2	*	.....	.....	
62	Gregory-Bobtail, g.	Colo.	550,000	550,000	1	*	.....	.....	
63	Gregory Con., g.	Mont.	3,000,000	300,000	10		.....	.....	
64	Harlem M. & M. Co., g.	Cal.	1,000,000	200,000	5		.....	.....	
65	Head Cent. & Tr., s. g.	Ariz.	10,000,000	100,000	100		.....	.....	
66	Hector, g.	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
67	Highland, c.	Mich.	500,000	25,000	20		.....	.....	
68	Hoffman, g.	Cal.	200,000	100,000	2		.....	.....	
69	Hortense, s.	Colo.	2,000,000	200,000	10		.....	.....	
70	Huron, c.	Mich.	1,000,000	40,000	25	280,000	May.	1887	3.00
71	Iron, Gold & Silver, s.	N. M.	2,000,000	200,000	10	*	.....	.....	
72	Ironton, I.	Wis.	1,000,000	40,000	25		.....	.....	
73	Iroquois, c.	Mich.	1,250,000	50,000	25		.....	.....	
74	J. Parker Quert.	Ariz.	10,000,000	100,000	100		.....	.....	
75	Julia Con., g. s.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1889	.10
76	Lacrosse, g.	Colo.	1,000,000	100,000	10	*	.....	.....	
77	Lee Basin, s. L.	Colo.	5,000,000	500,000	10	*	.....	.....	
78	Mayflower Gravel.	Cal.	1,000,000	100,000	10	585,000	Mar.	1890	.56
79	Medora, g.	Dak.	250,000	250,000	1		.....	.....	
80	Mexican, g. s.	Nev.	10,000,000

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Dec. 6.		Dec. 8.		Dec. 9.		Dec. 10.		Dec. 11.		Dec. 12.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams	....	....	1.50	....	....	....	....	....	....	....	....	....	200
Alice	....	....	....	....	....	....	....	....	....	....	....	....	....
Atlantic, Mich	16.25	....	....	....	....	....	....	....	....	....	....	....	100
Belcher, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	....	....	....	....	....	....	....	....	....	....
Bodie Cons., Cal	.95	....	....	....	....	....	....	....	....	....	....	....	100
Bos. & Mont., Mont	....	....	....	....	....	....	....	....	....	....	....	....	....
Breece, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Bulwer, Cal	.27	....	....	....	....	....	....	....	....	....	....	....	200
Caledonia	....	....	....	....	.82	....	.80	....	....	....	....	....	300
Calumet & Hecla, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Catalpa, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Colorado Cen.,Con, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Cal. & Va., Nev	....	....	....	....	....	....	....	....	3.10	....	....	....	100
Crown Point, Nev	....	....	....	....	1.60	....	....	....	1.50	....	....	....	200
Deadwood, Dak	....	....	1.40	....	....	....	....	....	....	....	....	....	700
Dunkin, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	....	....	....	....	....	....	....	....	....
Father de Smet, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin	18.18	....	....	....	....	....	....	....	....	....	....	....	50
Freeland, Colo	....	....	....	....	.28	.25	....	....	.30	.25	.30	.25	6,700
Gould & Curry, Nev	....	....	....	....	1.60	....	....	....	1.55	....	....	....	200
Hale & Norcross, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Holyoke	....	....	....	....	....	....	.64	....	....	....	....	....	100
Homestake, Dak	....	....	....	....	....	....	8.88	....	....	....	....	....	100
Horn-Silver, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Independence, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Iron Hill, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Kearsarge	....	....	11.25	....	....	....	....	....	....	....	....	....	100
Leadville C., Colo	....	....	.12	....	.13	.12	....	....	....	....	....	....	500
Little Chief, Colo	.32	.31	....	....	.30	....	....	....	....	....	.33	.32	2,200
Minnesota, Minn	....	....	....	....	....	....	....	....	....	....	....	....	....
Mono, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Mt. Diablo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Navajo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Belle Isle, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Utah	....	....	41.00	40.00	41.50	41.00	41.00	....	....	....	....	....	310
Ophir, Nev	....	....	....	....	3.60	....	....	....	3.65	....	3.50	....	300
Osceola, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Plymouth, Cal	2.25	....	....	....	....	....	....	....	....	....	....	....	200
Quicksilver, Pref	....	....	....	....	....	....	....	....	....	....	....	....	....
" Com	5.50	....	....	....	....	....	....	....	....	....	....	....	100
Quincy, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Robinson Cons., Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Savage	....	....	....	....	....	....	....	....	1.85	....	....	....	100
Sierra Nevada, Nev	....	....	....	....	....	....	1.95	....	1.9	....	....	....	200
Silver Cord	....	....	....	....	....	....	....	....	.25	....	....	....	100
Silver King, Ariz	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Mg. of L. V	....	....	....	....	....	....	....	....	....	....	....	....	....
Small Hopes	....	....	....	....	....	....	....	....	....	....	....	....	....
Standard	....	....	1.00	....	....	....	....	....	....	....	....	....	100
Stormont, Utah	....	....	.06	....	.06	....	.06	....	.05	....	....	....	500
Tamarack, Mich	157½	....	....	....	....	....	....	....	....	....	....	....	70
Yellow Jacket, Nev	....	....	....	....	....	....	....	....	....	....	2.15	....	100

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Dec. 6.		Dec. 8.		Dec. 9.		Dec. 10.		Dec. 11.		Dec. 12.		SALES
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Alta, Nev	....	....	.95	....	1.00	....	.95	....	....	....	.90	....	700
American Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Andes, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Amador, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Astoria, Cal	.05	....	....	....	....	....	.06	....	.06	.03	.04	....	10,800
Barcelona, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Best & Belcher, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Bonanza King, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Brunswick, Cal	.12	....	.13	....	.15	.11	....	....	.14	.12	.13	.12	10,000
Bullion, Nev	1.90	....	....	....	....	....	....	....	....	....	....	....	200
Butte & Bost., Mont	....	....	....	....	....	....	....	....	....	....	....	....	....
Castle Creek, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....
Chollar, Nev	....	....	2.60	....	2.50	....	2.50	....	3.00	....	2.60	....	500
Col. & Beaver, Idaho	....	....	....	....	....	....	.03	....	....	....	....	....	100
Commonwealth, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Comstock T., Nev	....	....	....	....	....	....	.15	....	.15	....	....	....	300
" bonds	....	....	....	....	....	....	.29	....	....	....	....	....	700
" scrip	....	....	....	....	....	....	.29	....	....	....	....	....	105
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Pacific, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Crescent, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Del Monte, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, Rep. of Col	....	....	....	....	....	....	.70	....	.65	....	....	....	600
Exchequer	.85	....	....	....	....	....	....	....	....	....	....	....	200
Hollywood, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Huron, Mich	3.88	....	3.63	....	....	....	....	....	....	....	....	....	400
Julia, Nev	.38	....	....	....	.38	....	.37	....	.38	....	.37	....	1,600
Justice, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....	....	....	....	....	....
Lacrosse, Colo	....	....	....	....	.09	....	....	....	....	....	....	....	100
Lee Basin, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Mexican, Nev	2.65	....	....	....	2.60	....	....	....	2.65	....	2.65	....	500
Middle Bar	....	....	....	....	.49	.20	.20	.10	....	....	.08	.05	25,800
Mutual Sm. & Mg. Co	1.50	....	1.50	....	1.45	....	1.45	....	1.45	....	1.40	....	1,200
Nevada Queen, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Commonwealth, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Occidental, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Oriental & Mil., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Overman, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Ariz	....	....	.60	.50	....	....	.50	.48	.45	....	.75	.45	2,400
Phœnix Lead, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Potosi	....	....	....	....	....	....	4.40	....	....	....	4.75	....	200
Proustite, Ida	....	....	....	....	....	....	....	....	....	....	....	....	....
Rappahannock	....	....	....	....	....	....	....	....	....	....	....	....	....
S. Sebastian	....	....	....	....	....	....	....	....	....	....	....	....	....
Scorpion	.30	....	....	....	....	....	....	....	....	....	....	....	300
Shoshone, Id	....	....	....	....	.02	....	....	....	....	....	....	....	200
Silver Queen	....	....	....	....	....	....	....	....	....	....	....	....	....
Sullivan Con., Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutro Tunnel, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutter Creek, Cal	1.00	....	1.00	....	....	....	....	....	1.00	....	1.00	....	1,400
Tioga, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Union Cons., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Utah, Nev	....	....	.80	....	.70	....	.70	....	.75	....	.65	....	1,100

* Ex. dividend. † Dealt in at the New York Stock Ex. Unlisted securities. ‡ Assessment paid. § Assessment unpaid. Dividend shares sold, 13,680. Non-dividend shares sold, 60,105. Total, New York, 73,785.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Dec. 5.		Dec. 6.		Dec. 8.		Dec. 9.		Dec. 10.		Dec. 11.		SALES.
Atlantic, Mich	15.00	....	16.00	....	....	....	16.00	15.75	16.00	15.50	15.38	15.00	1,022
Bodie, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Bonanza Development	....	....	....	....	....	....	.50	....	.50	....	.50	....	500
Bost. & Mont., Mont	43.25	42.75	43.00	41.50	41.75	40.50	42.63	41.50	42.50	41.00	41.75	41.00	6,047
Breece, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Calumet & Hecla, Mich	260	265	260	250	253	249	250	....	250	245	245	240	523
Catalpa, Colo	.29	....	....	....	....	....	.25	....	....	....	....	....	1,800
Central, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Chrysolite Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Cal. & Va., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo	....	....	....	....	....	....	....	....	....	....	.60	....	100
Eureka, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich	18.00	17.50	17.75	....	17.00	16.00	16.00	....	16.00	....	16.40	15.00	1,010
Honorine, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Horn Silver, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Kearsarge	12.00	11.13	11.00	....	10.63	....	11.00	10.50	11.50	9.00	10.50	9.00	2,067
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Moulton	....	....	....	....	....	....	....	....	....	....	....	....	....
Napa, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Osceola, Mich	34.00	33.00	33.00	32.00	32.50	31.50	32.50	32.00	32.00	30.38	32.00	31.00	3,805
Pewabic, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Quincy, Mich	93.00	....	90.00	85.00	85.00	81.00	....	....	90.00	86.50	85.00	....	240
Ridge, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nevada, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver King	....	....	....	....	....	....	....	....	....	....	....	....	....
Stormont, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Tamarack, Mich	157	....	151	150	150	144½	140	135	137	123	132	129	849
Tecumseh, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....

NAME OF COMPANY.	Dec. 5.		Dec. 6.		Dec. 8.		Dec. 9.		Dec. 10.		Dec. 11.		SALES.
Allouez, Mich	4.50	....	4.50	4.00	4.13	4.00	4.00	....	3.88	3.75	4.00	3.50	2,825
Arnold, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Aztec, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Brunswick, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Butte & Boston, Mont	....	....	14.00	13.50	14.00	13.50	14.50	13.50	14.00	13.00	13.75	12.50	2,176
Centennial, Mich	....	....	14.00	....	13.00	....	13.00	....	13.50	12.50	14.50	12.25	660
Comstock, T., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Copper Falls Mg	....	....	....	....	....	....	....	....	....	....	....	....	....
Crescent, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Dana, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Don Enrique, N. M	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, S. A	....	....	....	....	....	....	....	....	....	....	....	....	....
Hanover, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Humboldt, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Hungarian, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Huron, Mich	3.75	3.50	....	....	....	....	....	....	....	....	....	....	250
Mesnard, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
National, Mich	....	....	....	....	....	....	....	....	....	....	....	2.00	100
Native, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Oriental & M., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Phoenix	....	....	....	....	....	....	....	....	....	....	....	....	....
Pontiac	....	....	....	....	....	....	....	....	....	....	....	....	....
Rappahannock, Va	....	....	....	....	....	....	....	....	....	....	....	....	....
Santa Fe, N. Mex	.45	....	.45	.40	.42½	.40	.40	.37½	....	....	.37½	....	8,150
Shoshone, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....
South Side, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....	....	....	....	....	....
Washington, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Winthrop, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....

Boston: Dividend shares sold, 14,161. Non-dividend shares sold, 18,013. Total Boston, 32,174.

COAL STOCKS.

NAME OF COMPANY.	Par val. of shares.	Dec. 6.		Dec. 8.		Dec. 9.		Dec. 10.		Dec. 11.		Dec. 12.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cambria Iron	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cameron Coal & I.Co	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ches. & O. RR	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Chic. & Ind. Coal RR	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Col. C. & I	100	31¼	29⅞	31	29½	32¾	30¼	32	30½	33½	31¾	33	....	5,502
Col. & Hocking C. I.	100	....	....	....	....	....	....	....	....	15	....	15	....	200
Consolidation Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & H. C	100	127	124¼	124	120	124	122¼	124½	121	122½	120	124¾	123	5,906
D., L. & W. RR	50	129	127¼	129⅝	125¼	129¼	127¼	129½	125½	126¼	124¼	127¼	125½	176,406
Hocking Valley	100	22	21½	21½	19	22½	20	22½	21¼	....	....	22½	....	3,020
Hunt. & Broad Top	....	16½	....	15	13½	14	13½	16¼	....	....	....	....	....	1,490
Do. pref	....	42½	....	42½	39	39	38¼	41½	40	42¼	42	....	....	1,985
Illinois C & Coke Co	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lehigh C. & N	50	45	44¾	45	44¼	44¾	44⅜	44½	44⅛	44¼	44	....	....	5,426
Lehigh Valley RR	50	49	48¾	48¾	48	48¼	48	*47⅞	47½	48½	47¾	....	....	1,372
Lehigh & Wilk. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Mahoning Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Maryland Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Morris & Essex	100	....	....	....	....	110	....	....	....	....	....	....	....	9
New Central Coal	50	....	....	9	....	8½	....	8¼	....	8	....	....	....	550
N. J. C. RR	100	97½	96½	97⅛	93	97½	95½	97⅛	95½	96⅛	95	97	96¼	4,835
N. Y. & S. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Y., Susq. & West	100	....	....	6	....	5¾	....	6½	....	6	....	6⅜	6½	945
Do. pref	100	23	....	24	21½	23¼	22	22	....	22¼	22	23	....	3,440
N.Y. & Perry C. & I	100	....	....	....	....	....	....	....	....	....	....	12	10½	800
Norfolk & West. RR.	50	13	....	13	....	13	....	14	....	....	....	....	....	900
Do. pref	50	53⅛	53	52	51	52¾	51½	....	....	52½	....	53⅛	....	1,470
Penn. Coal	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. RR	50	49⅛	49	49⅛	48	48⅝	48¼	49⅛	48⅞	49⅛	48⅞	....	....	8,385
Ph. & R. RR	....	29¾	29	29¾	26¼	29	27⅝	29¼	28⅛	29¼	27¾	30	28⅞	**160,177
Sunday Creek Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Tennessee C. & I. Co	....	32	31	31	29	31	29½	31	28¾	30	28¾	31	30	8,447
Do. pref	....	....	....	....	....	....	....	79	....	....	....	....	....	100
Westmoreland Coal	....	....	....	....	....	....	....	....	....	....	....	....	....	....

*Ex-dividend. **Sales in New York, 93,075; in Philadelphia, 67,102. Total sales, 301,356.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS.					
	Dec. 5.	Dec. 6.	Dec. 8.	Dec. 9.	Dec. 10.	Dec. 11.
Alpha	....	....	....	....	....	....
Alta	.85	.85	.90	.80	.85	.80
Belcher	....	....	....	....	....	....
Belle Isle	....	....	....	.60	.50	....
Best & Bel	2.30	2.30	2.70	2.30	2.45	2.25
Bodie	.85	.90	.85	.90	.90	.80
Bulwer	.20	.20	.20	.20	.20	.20
Chollar	2.45	2.50	2.30	2.35	2.90	2.50
Com'wealth	....	2.00	....	1.50	1.50	1.15
Con. C. & V	3.20	3.15	....	3.05	3.20	3.00
Con. Pacific	....	....	3.00	....	....	....
Crown Point	1.60	1.55	1.50	1.40	1.50	1.40
Eureka C	3.00	3.00	....	....	....	....
Gould & C	1.60	1.60	1 50	1.45	1.50	1 45
Grand Prize	....	....	....	....	....	....
Hale & N	1.60	1.50	1.45	1.45	1.55	1.50
M. White	....	....	....	....	....	....
Mexican	2.70	2.80	2.50	2.45	2.65	2.50
Mono	.55	.65	.50	.50	.55	.50
Mt. Diablo	....	....	....	....	....	....
Navajo	.25	.20	.20	.20	.20	.20
Nev. Queen	....	....	.60	.50	.50	.50
N. Belle Isle	.90	.90	....	.75	.75	.70
N.Com'w'lth	....	....	....	1.00	1 00	.75
Ophir	3.50	3.55	3.40	3.40	3.65	3.35
Potosi	4 00	4.10	3.75	4.10	3 65	4.50
Savage	1.80	1.70	1.50	1.55	1.75	1.60
Sierra Nev	1.35	1.90	1.80	1.85	1.95	1.85
Union Con	2.05	2.10	1.95	1.90	2.00	1.90
Utah	.65	.70	.60	.55	.60	.50
Yellow Jak	2.15	2.10	2.05	2.00	2.10	2.00

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	$	$ ....
Balt. & N. C.	....	.17
Big Vein Coal	....	....
Conrad Hill	....	.10
Cons. Coal	.23½	.26
Diamond Tunnel	....	....
George's Crk. C.	....	1.15
Lake Chrome	....	....
Maryland & Charlotte	....	....
North State	....	....
Silver Valley	....	.75

Prices bid and asked, lowest and highest, during the week ending December 11.

Birmingham, Ala. Dec. 10.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. Coal & I. Co.	....	$100
Ala. Conn. C. & C. Co.	....	$23
Ala. R. Mill Co.	$100	....
*Alice Furnace	$103	....
Anna Howe G. Mg. Co.	$½	....
Bessemer Land	$27	$29
Bir. Mg. & Mfg.	....	$39
Cahaba Coal Mg. Co.	....	$61
Camille Gold Mg. Co.	$½	....
De Bardeleben C. & I. Co.	$49	....
Decat. L. Imp.	$10	$11¼
Decatur Min. L.	....	$19
Ensley Land	$7⅝	$8⅛
*Eureka	**$99	$102½
Florence L. & Mg. Co.	$19¼	....
Gadsen Land	*$3⅛	$4⅜
Hecla Coal Co.	$10	....
Hen. S. & M. Co.	$25	....
Jagger-Towni'y C. & C. Co.	$3½	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co.	$25	....
Sheffield C. & I. Co.	....	$42
Sloss I. & S	$20	$30
†Sloss I. & S	....	$91½
†† Sloss I. & S.	....	$60
Tuscaloose C. I. & L. Co.	$22½	$24
Ten. C. & I. Co.	$34	$35
" pref.	$79	$81
Vulcan C. & C. Co.	$5	....
Woodstock I. Co.	....	$30

* Bonds. † First mortgage. †† Second mortgage. ** Without interest.

Pittsburg, Pa. Dec. 16.

COMPANY.	B.	A.	Closing.
Allegheny Gas Co.	$10.00	....	$40.00
Bridgewater Gas Co.	....	$....	....
Chartiers Val. Gas.	20.00	....	20.00
Columbia Oil Co.	2.25	3.00	3.00
Consolidated Gas Co.	....	....	....
East End E. Light Co.	....	....	....
East End Gas Co.	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co.	....	....	....
La Noria Mining	.19	.20	.19
Luster Mg. Co.	20.25	20.50	30.50
Mansfield C. & C. Co.	....	....	....
Manuf'turers Gas Co.	20.00	....	20.00
Nat. Gas Co. of W. Va	....	....	....
N. Y. & Clev. Gas Coal.	35.00	....	35.00
Ohio Valley Gas.	....	25.00	25.00
Pennsylvania Gas	....	12.75	12.75
People's Natural Gas.	....	....	....
People's N. G. & P. Co.	10.00	12.00	12.00
Philadelphia Co.	*16.38	*15.50	*16.00
Pine Run Gas Co.	....	35.00	....
Pittsburg Gas	....	....	....
Silverton Mg. Co.	....	....	....
South Side Gas.	25.00	....	25.00
Tuna Oil Co.	....	....	....
Union Gas.	....	....	....
Washington Oil Co.	90.00	90.00	....
W'house Brake Co	....	74.00	74.00
W'house A. B. Co.	112.00@112.50		112.00
W'house E. Light.	*18.00	*17.00	*17.50
W'morel'nd & Camb.	17.00@18.00		17.00
Wheeling Gas	....	15.00	....
Yankee Girl Mg	....	....	....

Prices bid and asked and sales during week ending Dec. 10:

Philadelphia Gas Co.	150 shs.	$15.50@$16.38
West. Electric	80 "	$17.00@$18.00

* Actual selling price.

St. Louis. Dec. 10.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$1.57½	$1.70
American & Nettie.	.50	.52½
Aztec, N. Mex.	.08	....
Bi-Metallic	31.50	32.50
Central Silver	.07½	.08½
Cleveland, Colo.	.03	.05
Cleveland & An'r.	....	....
Cour d'Alene	....	....
Elizabeth	2.17½	2.22½
Gold King	.10	11½
Granite Mountain, Mont.	....	45.50
Hope	....	....
Ingram	....	....
I. X. L. Colo.	....	....
La Union	.01½	.02½
Little Albert	.18½	.21½
Montrose Placer, Colo.	.45	.47½
Major Budd, Mont.	.03	.04
Mexican Imp.	....	....
Mickey Breen.	.76¼	.77½
Mountain Key	.42½	.46¼
Nellie	....	....
Old Colony	....	....
Pat Murphy, Colo.	.09	.10
Puzzle	....	....
Richmond Hill	....	....
Samoa	....	....
Silver Age, Colo.	....	....
Small Hopes, Colo.	.86¼	.90
Tourtelotte	....	....
West Granite, Mont.	....	....
Wire Patch	....	....
Yuma, Ariz.	.53¾	.55

Trust Stocks. Dec. 12.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

Am. Cotton Oil. Tr. Repts.	$16⅝@$16⅞
Cattle Trust	9 @ 15
Distillers' & Cattle Feeders'.	40 @ 40⅜
Linseed Oil	36½@ 39
National Lead	15⅜@ 15¾
Standard Oil	158 @160
Sugar Refineries, Tr. repts.	53 @ 53½

Sales at the New York Stock Exchange week ending Dec. 12:

	Sales.	Price H.	Price L.
*American Cotton Oil.	4,415	16¾	12¼
National Lead	32,620	15¾	14⅛
*Sugar	30,930	55⅛	50

* Trust receipts.

Foreign Quotations.

London. Nov. 29.

COMPANY.	Highest.	Lowest.
Almada, Mex.	1s. 3d.	9d.
Amador, Cal.	£⅜	£½
Appalachian, N. C.	9d.	3d.
Canadian Phos., Can.	£¼	£¼
Colorado, Colo.	3⅜s.	3½s.
Comstock, Utah.	....	....
Cordova	....	....
Cons. Esmeralda, Nev.	4s.	3s.
Denver Gold, Colo.	....	....
Dickens Custer, Idaho.	1s. 6d.	1s. 3d.
East Arevalo, Idaho.	....	....
El Callao, Venezuela.	£1¾	£1½
Elmore, Idaho	2s. 3d.	1s. 9d.
Garfield, Nev	1s. 6d.	6d.
Jay Hawk, Mont.	1s. 6d.	1s.
Josephine, Cal.	1s.	6d.
Kohinoor, Colo.	2s. 3d.	1s. 9d.
La Luz, Mex.	1s. 6d.	1s.
La Valera, Mex.	20s.	15s.
Montana Lt., Mont.	£1 1/8	18s. 9d.
New California, Colo.	6s. 9d.	6s. 3d.
New Consolidated	5d.	3d.
New Eberhardt, Nev.	1s.	9d.
New Emma, S., Utah.	3s.	2s. 6d.
Newfoundland, N. F.	3s. 6d.	3s.
N. Gold Hill, N. C.	1s.	6d.
New Guston, Colo.	£3¼	£2¾
New Hoover Hill, N.C.	1s.	6d.
Old Lout, Colo	£½	£¼
Palmarejo, Mex.	16s.	14s. 9d.
Pinos Altos, Mex.	10s. 6d.	9s. 6d.
Pittsburg Cons., Nev.	8s. 6d.	7s. 6d.
Richmond Con., Nev.	£1⅝	£1⅝
Ruby & Dunderb'g, Nev.	2s. 3d.	1s. 9d.
Sam Christian, N. C.	1s.	6d.
Sierra Buttes, Cal.	5s.	4s. 3d.
" Plumas Eur., Cal.	£11-16	£9-16
Sonora, Mex.	1s.	6d.
United Mexican, Mex.	8s.	7s.
U. S. Placer, Colo.	1s. 3d.	9d.
Viola Lt., Idaho.	1s. 6d.	1s.
Yankee Girl, Colo.	£1 7-16	£1 5-16

Highest and lowest prices during the week ending November 8.

Paris. Nov. 27.

	Francs.
Belmez, Spain	780.00
Callao, Venez	40.00
Callao Bis., Venez.	6.50
East Oregon, Ore.	4.50
Forest Hill Divide, Cal.	80.00
Golden River, Cal.	130.00
" " parts	30.00
Lexington, Mont	123.75
" " parts	3.75
Rio Tinto, Spain	592.50
Tharsis, Spain	152.00

CURRENT PRICES.

Those quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $1.75@$2.00
Muriatic, 18° ℔ 100 lbs. 1.00@1.50
Muriatic, 20° ℔ 100 lbs. 1.12½@1.75
Muriatic, 22° ℔ 100 lbs. 1.37½@2.00
Nitric, 36° ℔ 100 lbs. 4.00@4.29
Nitric, 42° ℔ 100 lbs. 6.00@6.25
Oxalic, ℔ 100 lbs. 6.50@10.50
Sulphuric, 60° ℔ 100 lbs. 80@1.25
Sulphuric, 66° ℔ 100 lbs. 1.00@1.75

Alkali—
Refined, 48 p. c. 1.60@1.65
Refined, 58° 1.55@1.90

Alum—Lump, ℔ lb. 1¾
Ground, ℔ lb. 1¾@2
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10

Ammonia—Sul., ℔ 100 lbs. 3.15
Carb, ℔ lb. 7½@8¼

Aqua Ammonia—18° ℔ lb. 4½
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

Ammoniates—Azotine, ℔ unit 1 95@ 2 00
Blood, dried, red, ℔ unit, west 1 80@ 1 90
low grade, ℔ unit. 1 70@ 1 80
Concentrated tankage, ℔ unit 1 75@ 1 80
Bones, rough, ℔ ton 20 00@23 00
ground, ℔ ton. 25 00@28 00
Bone black, refuse, ℔ ton 17 50@19 50
Kieserite 6 00@ 6 50
Fish guano, dried 18 50@19 00
acidulated 10 00@ — 00
wet 8 50@ 9 50
Phosphate rock, f. o. b Char'n 6 00@ 7 25
undried — @ 6 —
dried 7 00@ 7 50
ground 8 00@11 50
Acid phosphate, 14% per unit. 72½@ 75

Arsenic—White, powdered ℔ lb. 3¼@3½
Red ℔ lb. 6¾@ 8¼
White at Plymouth, ℔ ton £12 2 6

Asbestos—Am., ℔ ton $50@$300
Italian, ℔ on. c. i. f. L'pool £18@£60

Ashes—Pot, 1st sorts, ℔ lb. 4¼@4⅝
Pearl 6¼@6½

Asphaltum—P. ton. 13.00
Prime Cuban, ℔ lb. 4½@5¼c.
Hard Cuban, P ton $28.00
Trinidad, refined, ℔ ton $30.00
Egyptian 8@9

Barium—Nitrate, ℔ lb. 8@8½

Barytes—Sulph., Am. prime white £17@20
Sulph., foreign, floated, ℔ ton. £19½@21.50
Sulph., off color, ℔ ton. 11.50@14.00
Carb., lump, f. o. b. L'pool, ton .66
No. 1. Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " 3 15 0

Bleach—Over 35 p. c., ℔ lb. 1.85@1.90

Borax—Refined, ℔ lb. 9½@9¾
Concentrated 7¾@8¾
Refined " Liverpool ℔ ton £29

Brimstone—*See Sulphur.*

Bromine—℔ lb. 37@38

Chalk—℔ ton. 1.75
Precipitated, ℔ lb. 4½@5

China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton. 13.50

Chrome Yellow—℔ lb. 10@2

Cobalt—Oxide, ℔ lb. 2.60@2.90

Copper—Sulph. English Wks. ton £20@£21

Copperas—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks. £1 15s.

Cream of Tartar—Am. 99%. 22½
Powdered, ℔ p. c. 23

Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb. 2¾@3½

Feldspar—Ground, ℔ ton 15.00

Fuller's Earth—Lump, ℔ bbl. 90@95
Powdered, ℔ lb. 1¾@2

Gypsum—Calcined, ℔ bbl. 1.25@1.50

Iodine—Resublimed 2.75

Kainit—℔ ton. $9.75@$10

Kaolin—*See China Clay.*

Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb. 8½@8¾
Acetate, or sugar of, white. 12@13
Nitrate 9@10

Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½

Litharge—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½

Magnesite—Greek, ℔ ton 20.00

Manganese—Crude, per unit. 23@28
Oxide, ground, per lb. 2½@6½

Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. 70@72

Metallic Paint—Brown per ton. $20@25
Red. $20@25

Mineral Wool—℔ lb. 2

Mica—In sheets according to size.
1st quality, ℔ lb. 25@$6.00

Naphtha—Black. 60

Ochre—Yellow, "B. F.," ℔ ton, f. o. b. mill. 30.00
"J. F. L. S.," ℔ lb. ex dock. 2½
Yellow 10@25
Rochelle. 1.35@1.50
Washed Dutch. 5@—
Washed French. 1½@2¼
Washed Nat Oxford, Lump. 6½@6¾
Washed Nat Oxford, Powder. 7@7½
Golden 3¾@4
Domestic. ¾@1½
Domestic, for O. C. & W. P. ⅝@1

Oils, Mineral—
Cylinder, light filtered. 15@20
Dark filtered. 14@21
Extra cold test. —@—
Dark steam refined. 10@18

Phosphate Rock—S. Carolina, per ton f. o. b. Charleston. 6.00@7.25
Ground, ex vessel New York. 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton. 16.00

Phosphorus—℔ lb. 64@65
Precip., red 100@102
white. 100@103

Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7

Potassium—Cyanide, ℔ lb. 39@40
Bromide, ℔ lb 33
Chlorate, English, ℔ lb 11@14
Chlorate, powdered 13@14
Carb, ℔ lb. 4.70@5.54
Caustic, ℔ lb. 7½@8
Iodide. 2.65@2.70
Muriate, ℔ 100 lbs. 1.82½
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb. 10½@11
Dble. m'ure salt, basis of 48@50%. 1.07½
Sulphate, basis of 90% ℔ 100 lbs. 2.05
Yellow Prussiate. 17½@18
Red Prussiate. 42@45

Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2¼@2½

Pyrites—Non-cupreous, p. units 10d.

Quartz—Ground, ℔ ton. 14.00@16.00

Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb. 0@10

Salt—Liverpool, ground, ℔ sack 75@80
Turk's Island, ℔ bush. 25@28

Salt Cake—℔ lb. 70@75

Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8

Silex, ℔ ton. 14@25

Soda—Carb Ash, 48%. 1.60@1.65
" high test. 1.55@1.60
Caustic ash, 48%. 1.62½@1.65
" high test. 1.60
Newcastle, 48%. — @ —
" high test. 1.50@1.55
Bicarb, English. 3.50@3.75
" American. 3c@3½
Crystal, carbonate. 1.95@2.00
Caustic, 60%. 3.40@5.50
" 70%. 3.15@3.20
" 74%. 3.15@3.20
" 77%. 3.25@3.37½
Sal, English. 1.17½@1.20
" American. 1.10@1.15
Nitrate. 1.80@1.85
Prussiate. 17½@18
Phosphate 7@18
Stannate. 8@15

Strontium—Nitrate, ℔ lb. 9@9½

Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb. 20
Crude Brimstone, 2s., ℔ ton. 27 00
Crude Brimstone, 3ds. ℔ ton. 26.50

Sylvinit, 23@27%, S. F. P., per unit. 40@42½

Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton. $18@$20
c. i. f. Liverpool, ℔ ton. £4 5

Terra Alba—French. 80@85
English. 75@80
American, No. 1. —@—
American, No. 2. 40@50

Tin—Crystals. 15½@16
Muriate. 8@ 3

Vermillion—American, ℔ lb. 61
English ℔ lb. 82@85

Vitriol—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb. 7

Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb 6½@7
* Spot.

THE RARER METALS.

Aluminum—(Metallic), per lb. $1.50@$2
Sheet, per lb 2.50

Arsenic—(Metallic), per lb .40

Barium—(Metallic), per gram. 4.00

Bismuth—(Metallic), per lb. 2 75

Cadmium—(Metallic), per lb. 1.00

Calcium—(Metallic), per gram. 10.00

Cerium—(Metallic), per gram. 7.50

Chromium—(Metallic), per gram. 1.00

Cobalt—(Metallic), per lb. 6.00

Didymium—(Metallic), per gram. 9.00

Erbium—(Metallic), per gram. 7.50

Gallium—(Metallic), per gram. 140.00

Glucinum—(Metallic), per gram. 12.00

Indium—(Metallic), per gram. 9.00

Iridium—(Metallic), per oz. 7.00

Lanthanum—(Metallic), per gr. 10.00

Lithium—(Metallic), per gram. 10.00

Magnesium—Per lb. 4.50

Manganese—(Metallic), per lb. 1.10
Chem. pure, per oz. 10.00

Molybdenum—(Metallic), per gm .50

Niobium—(Metallic), ger gram. 5.00

Osmium—(Metallic), per oz. 65.00

Palladium—(Metallic), per oz. 35.00

Platinum—(Metallic), per oz. 20.00@25.00

Potassium—(Metallic), per lb. 28.00

Rhodium—(Metallic), per gram. 5.00

Ruthenium—(Metallic), per gm. 5.50

Rubidium—(Metallic), per gram. 2.00

Selenium—(Metallic), per oz. 1.80

Sodium—(Metallic), per lb. 2.50

Strontium—(Metallic), per gm. .60

Tantalum—(Metallic), per gram. 9.00

Telurium—(Metallic), per lb. 5.00

Thallium—(Metallic), per gram. .25

Titanium—(Metallic), per gram. 2.25

Thorium—(Metallic), per gram. 17.00

Tungsten—(Metallic), per oz. 2.25

Uranium—(Metallic), per lb. 5.00

Vanadium—(Metallic), per gm. 22.00

Yttrium—(Metallic), per gram. 9.00

Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000. 3.00@3.50
Jerseys, ℔ 1,000. 4.75@5.25
Up Rivers, ℔ 1,000. 5.00@5.50
Haverstraw seconds, ℔ 1,000. 5.50@6.00
Haverstraw firsts, ℔ 1,000. 6.00@6.25
Fronts, nominal, ℔ 1,000 —@—
Croton. 14.00@16.00
Wilmington. 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore

Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu. ft. 45@1.25
Granite, Scotch, ℔ cu. ft. 1.00@1.15

Cement—Rosendale, ℔ bbl. 85@1.10
Portland, American, ℔ bbl. 2.15@2.45
Portland, foreign, ℔ bbl. 2.40@2.50
Portland, " special brands 2.60@2.85
Roman, ℔ bbl. 2.75@2.90
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.25@8 50

Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black roofing, ℔ 100 sq. ft. 4.25@5.50

Lime—Rockland, common, ℔ bbl. .90
Rockland, finishing, ℔ bbl. 1.10
St. John, com. and finish., ℔ bbl. 85@ .90
Glens Falls, com. and fin., ℔ bbl. 85@1.10

Labor—Ordinary, ℔ day. 1.50@2.00
Masons, ℔ day. 4.00
Plasterers, ℔ day. 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day. 2.50@3.50
Stonesetters, ℔ day. 3.50@4.00
Tilelayers, ℔ day. 3.50@4.50
Bricklayers, ℔ day. 4.00